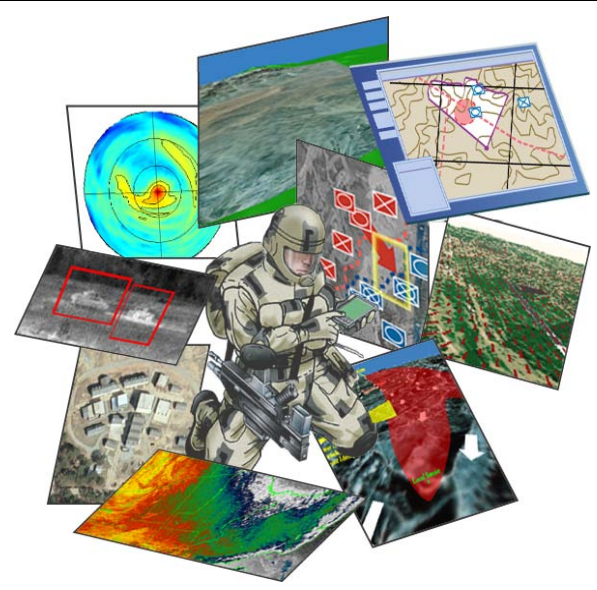


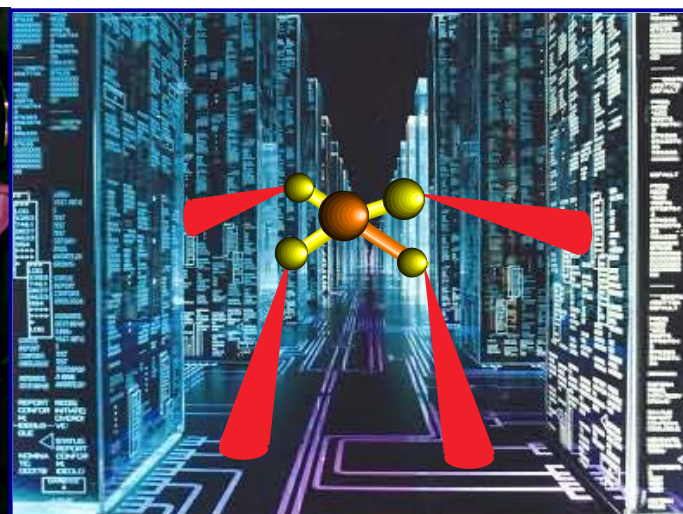




Mission Effectiveness: Proposed Nth-Order Taxonomy -- Concepts, Theory, and Policy --

Dr. Paul W. Phister, Jr., P.E.

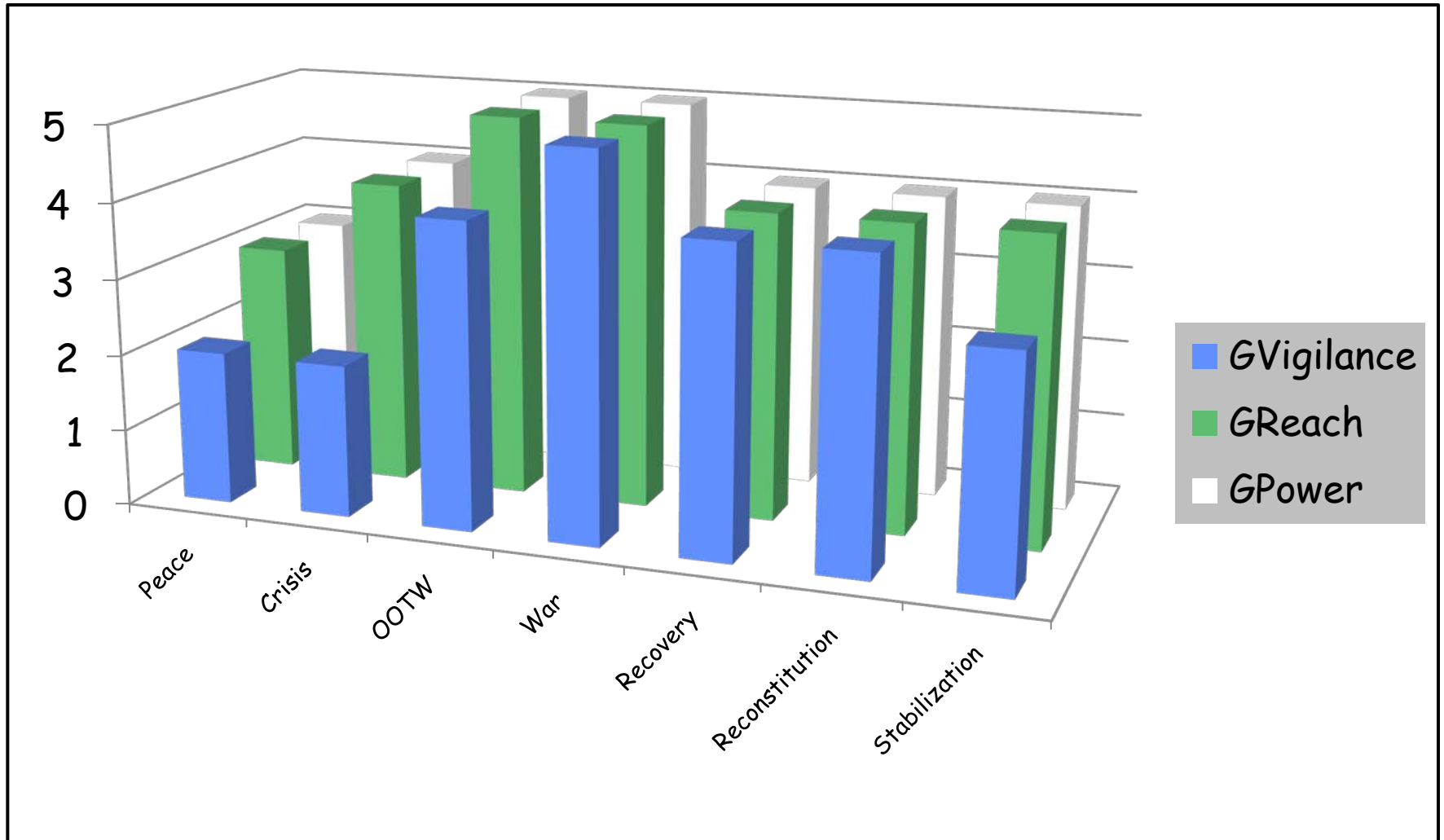
AF Research Laboratory's Information Directorate, Rome, NY





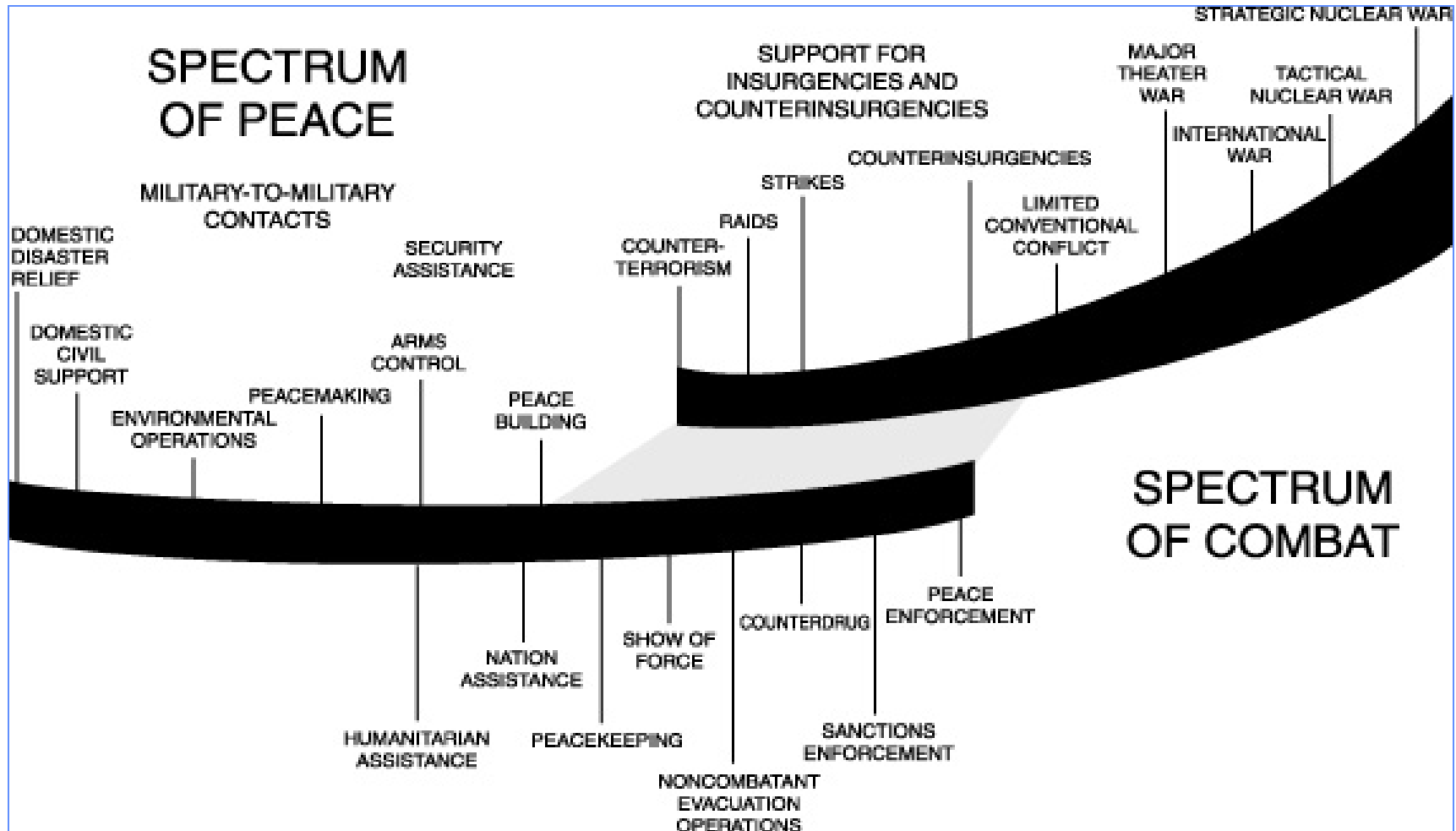
Phases of Conflict

- Global Vigilance, Reach and Power -





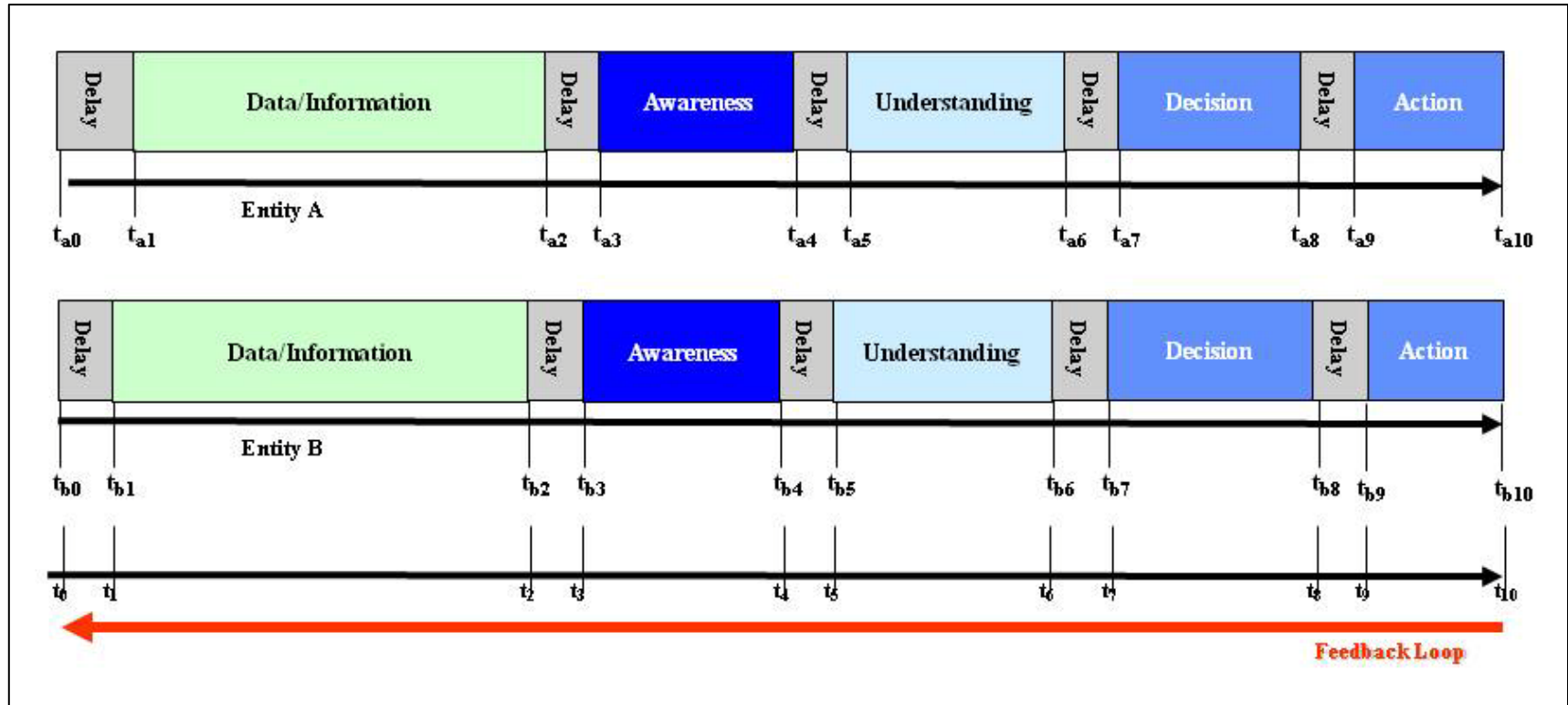
Span of a Complex Endeavor





Network Centric Warfare

- Operational Timelines -



Metrics:

-----→ Time to Collect Data

-----→ Time to Awareness

-----→ Time to Understanding

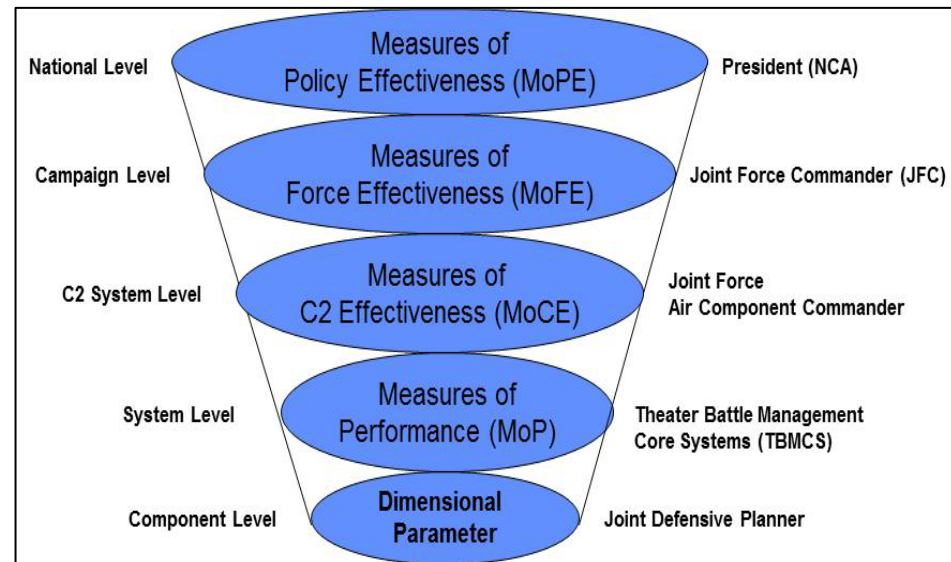
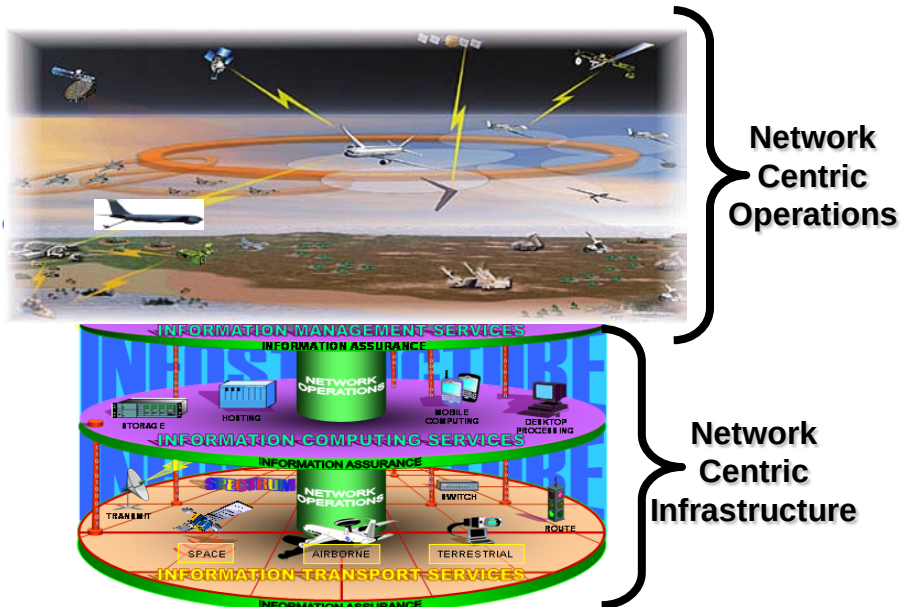
-----→ Speed of Command

-----→ Speed of Action



Network Centric Warfare

- Measures of Effectiveness -



Metrics: Political, Diplomatic, Military, Economic, Social, Information, Infrastructure



Proposed Nth-Order Taxonomy

- Strategic - Tactical - Operational -



Nth Order	Description	Level	Area	MOPs/MOEs
0	Actual Event	Tactical	Local	
1	Desired Effect	Tactical	Local	DP
2	Collateral Damage (Physical)	Tactical	Local	DP
3	Collateral Damage (Non-Physical)	Tactical	Local	DP
4	C2 Systems Effectiveness	Operational	Regional	MoCE
5	Command Intent Effectiveness (e.g., JFACC, JFLCC, JFMCC)	Operational	Regional	MoFE
6	Command Intent (JTF) Effectiveness	Operational	Regional	MoFE
7	National ROE/Policy Effectiveness	Strategic	Global	MoPE
8	Coalition ROE/Policy Effectiveness	Strategic	Global	MoPE
9	International ROE/Policy Effectiveness	Strategic	Global	MoPE



Mathematical Representation

- Proposed Nth-Order Taxonomy-



$$\text{MOE (cyber agility)} = f(\text{belief}) + f(\text{disbelief}) + f(\text{uncertainty})$$

Scoring Metric:

0.00 = Detrimental to Mission Operations,

0.25 = Unacceptable to Mission Operations,

0.50 = Acceptable to Mission Operations,

0.75 = Very Acceptable to Mission Operations,

1.00 = Significantly Acceptable to Mission Operations

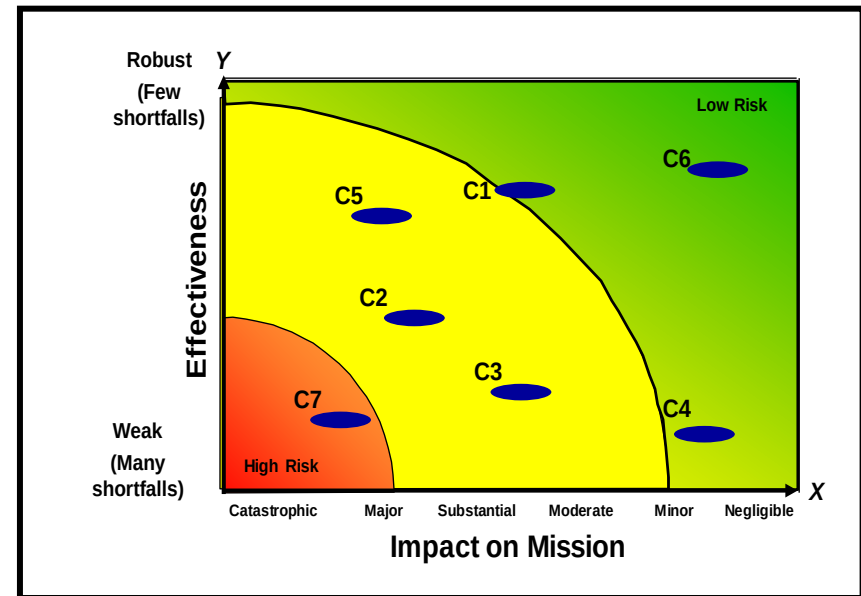
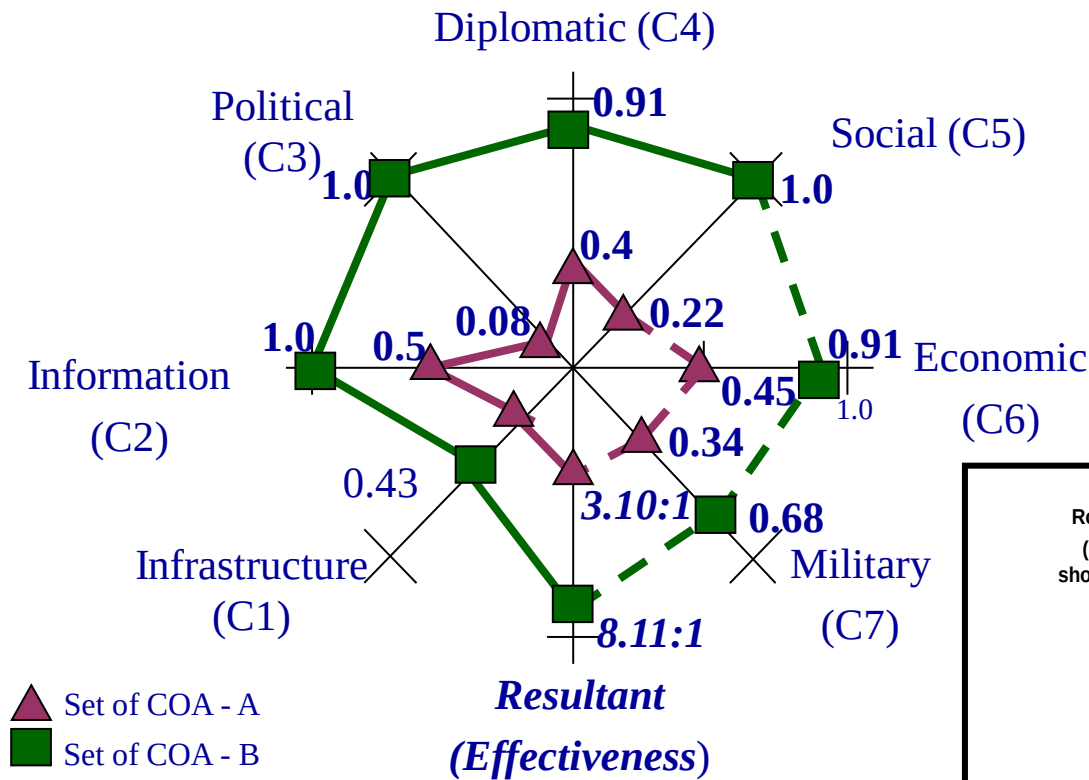
Denny, Nathan,

"Mission Profiles and Evidential Reasoning for Estimating Information Relevancy in Multi-Agent Supervisory Control Applications,"
15th ICCRTS, Paper 113, June 2010, page 4, 10, and 13.



Mathematical Representation

- Proposed Nth-Order Taxonomy Analysis -





Conclusions



- **Need to Plan / Assess Operations within a Complex Endeavor**
- **Combine PEMSII and DIME into Proposed Nth-Order Taxonomy:**
 - **Political, Diplomatic, Military, Economic, Social**
 - **Information, Infrastructure**
- **Proposed Nth-Order Taxonomy**
 - **Incorporates Net-Centric Operations**
 - **Incorporates Strategic, Tactical, Operational Factors**
- **Provides consistent in-depth analytical capability**
 - **Indicating 7th-Order effect (National ROE/Policy Effectiveness)**
will convey consistent context

Goal is to conduct robust analysis in developing COAs



Questions?



AFRL "Inside"