Facilitating Informed Decisionmaking: Consensus Building Using E-DEL+I

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*Electronic Decision Enhancement Leverager plus Integrator (E-DEL+I™, ©, provisional patents, RAND)

Outline

- **Background – informed decisionmaking in the policy arena**
- **What is the E-DEL+I approach?**
- **Why is E-DEL+I valuable?**
- **How has E-DEL+I been used?**
- **E-DEL+I lessons learned**

Informed Decisionmaking with Diverse Stakeholders Is Complicated

- **Issues are complex**
- **Actions have far reaching impact on many organizations**
- **Meaningful communications among stakeholders may be limited, unorganized, based on different assumptions, and "unofficial"**
- **Each stakeholder must balance his focused interest with need to interact with others**
- **Requires awareness of others' needs and views**

Existing Techniques for Informed Decisionmaking Are Lacking

- **Undisciplined**
- **Costly**
- **Logistically burdensome to implement**
- **Ineffective**
  - **Fractured focus**
- **Independence and anonymity not supported**
- **Input mechanism not balanced**
  - **Written versus verbal**

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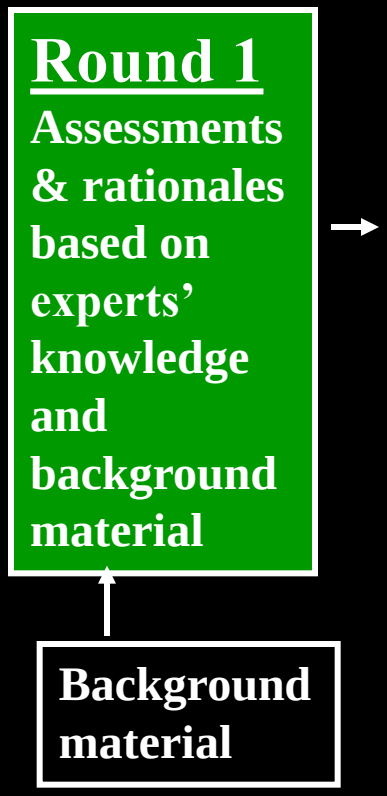
E-DEL+I Is A Technique That Facilitates Informed Decisionmaking

- **Applicable to complex issues that involve multiple dimensions**
  - **Technical, political, military, cost, return on investment, legal, or other aspects**
- **Can blend technical expertise and understanding of military operations/doctrine/policy to arrive at a balanced solution acceptable to all stakeholders**
- **Especially effective when critical data must be derived from information that resides in the collective knowledge base of many individuals and organizations**

E-DEL+I Exercises Are Tailored to the Application

- **Expert panel**
  - **Panel's collective knowledge base spans the issues to be addressed**
  - **Panel is balanced in multiple dimensions**
- **Metric**
  - **Devised to assess dimensions critical to the issue**
- **Questionnaire**
  - **Designed to solicit assessments**
- **Standard for consensus**
  - **Higher than simple majority**

A Typical E-DEL+I Exercise Has Four Rounds

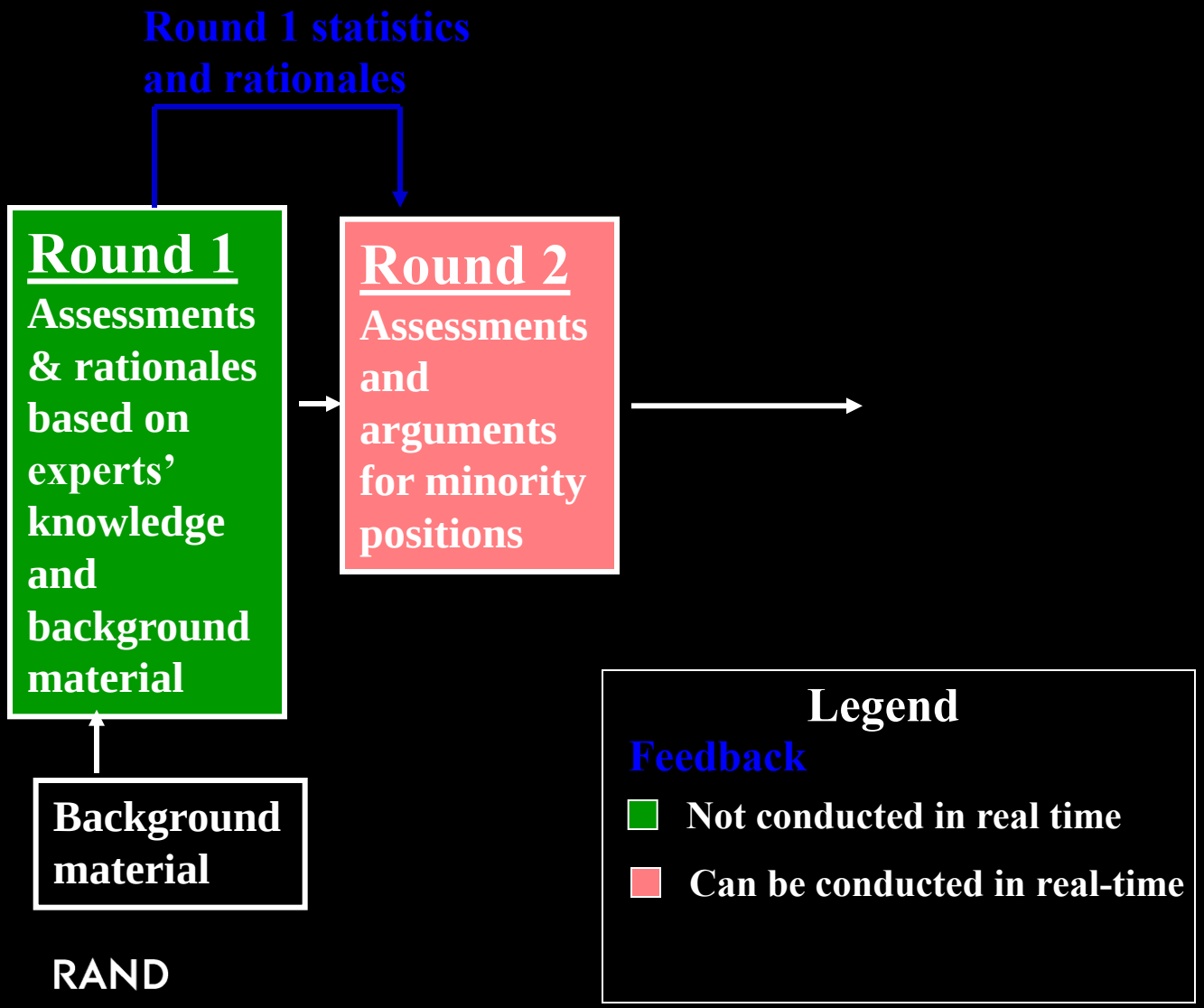


Legend

- Not conducted in real time

RAND

A Typical E-DEL+I Exercise Has Four Rounds



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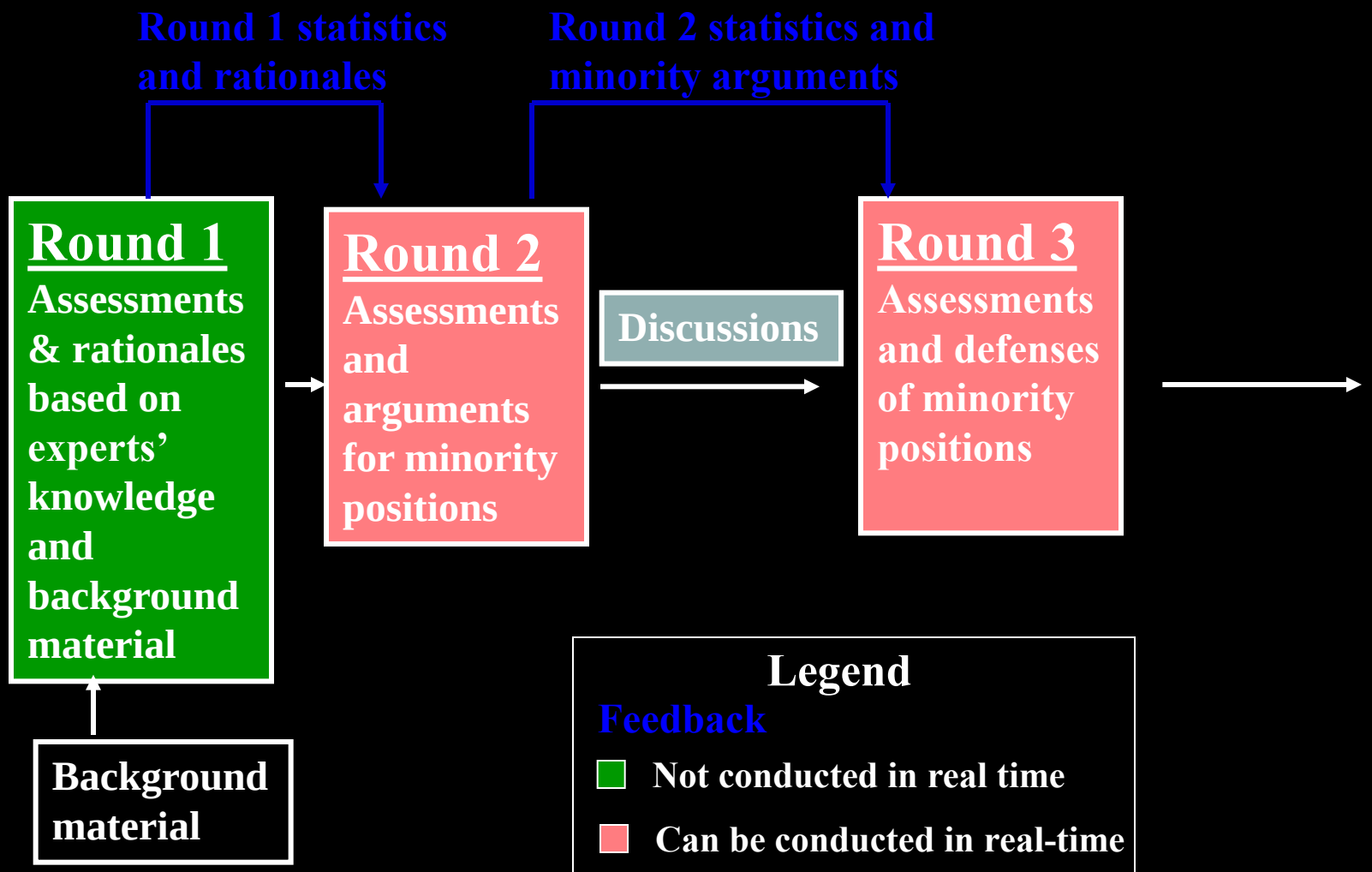

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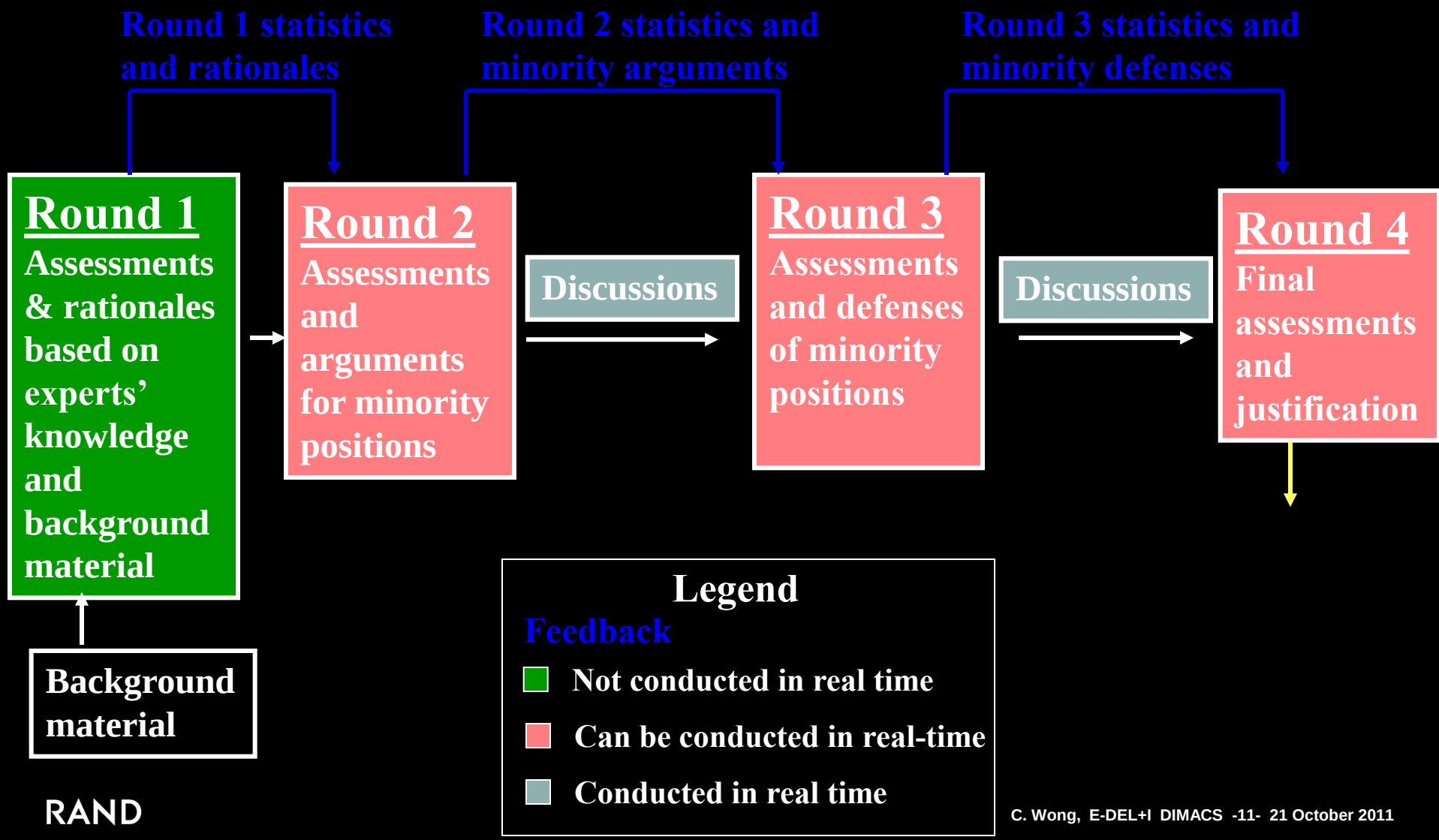

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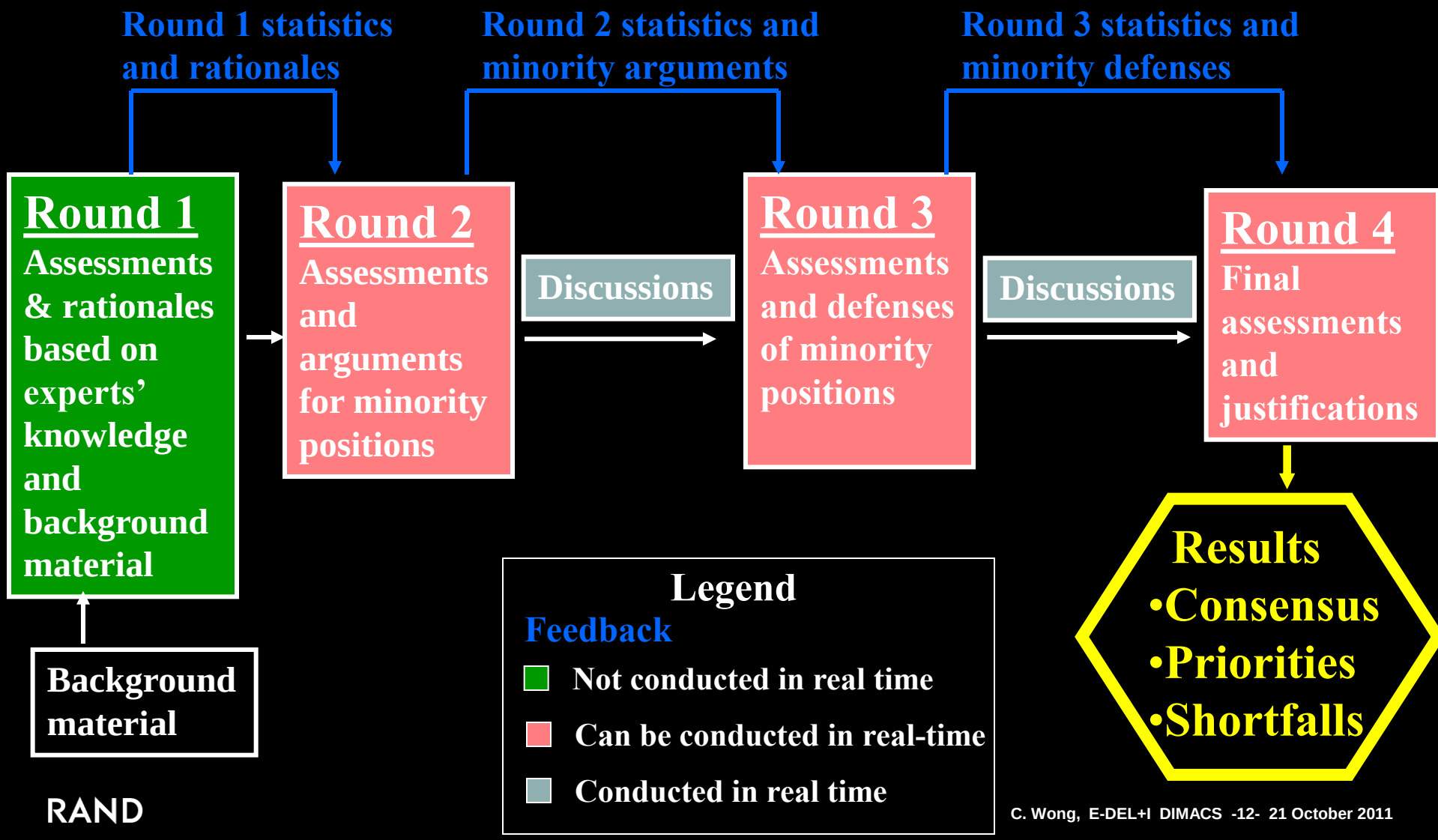

RAND

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E-DEL+I Consists of a Framework and a Process with Built-in Flexibility

- **Incorporates structured integration of diverse inputs**
- **Supports electronic exercises enabling many experts to participate from diverse physical locations**
- **Has iterative feedback feature to encourage a team approach**
- **Includes discussion sessions to encourage collaborative solutions**
- **Allows for comprehensive tracking and quantitative measures of priority/importance**

E-DEL+I Maximizes Objectivity

- **Independent assessments**
- **Anonymity of expert panel members**
- **Discussion sessions are facilitated by neutral party**
- **Final E-DEL+I exercise results define a way forward**
  - **Feasible alternatives are identified**
  - **Relative priority/importance of alternatives are revealed**
  - **How many and which stakeholders agree/disagree and why are known**
  - **Areas of concern and negotiation points are revealed**

E-DEL+I Minimizes Cost and Logistical Burden

- **Uses commonly available resources**
- **Exercise material sent electronically to participants**
  - **E-mail with capability to read attachments**
  - **Microsoft Excel to complete questionnaire**
  - **Telephone to participate in discussion sessions**
- **Exercise is iterative**
  - **Can take 2-3 hours or activities can be spaced over weeks**
  - **Participation requires filling out questionnaire for each round and engaging in discussion sessions**
- **Past exercises used expert panels consisting of 7 to 24 members**

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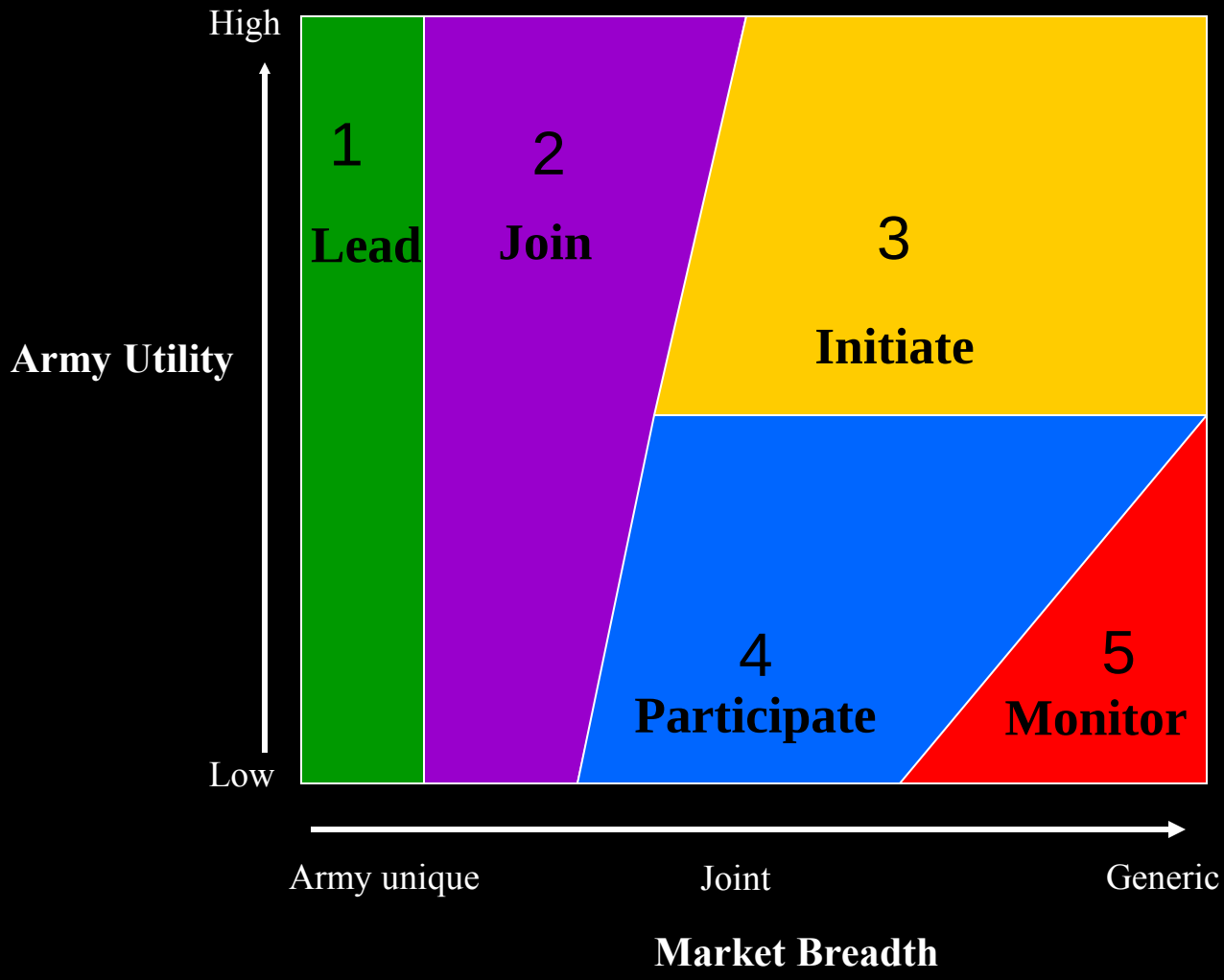
Example: E-DEL+I Smart Outsourcing Exercise

- **Project purpose: How can the Army accomplish more with its research dollars?**
- **Approach: Use E-DEL+I to place Army technologies on a market breadth-Army utility framework**
- **Expert panel: 13 members in 13 physical locations**
- **Implementation: Round 1**
  - **Not in real time**
  - **Designed to encourage participants to review background material and familiarize themselves with Excel format**
- **Implementation: Rounds 2, 3, 4 with discussions**
  - **Real time with e-mail file transmission and conference call**

Example: E-DEL+I Smart Outsourcing Metric



1 **Lead** – Army performs research in-house

2 **Join** – Army joint research with other agencies.

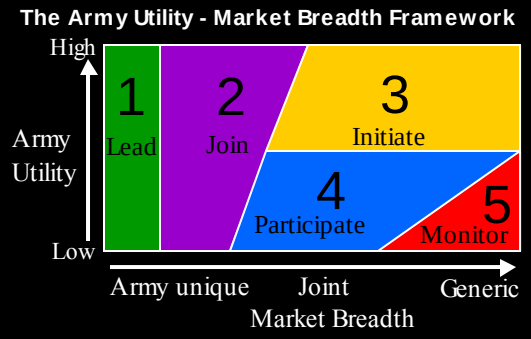
3 **Initiate** – Army initiates collaboration with industry.

4 **Participate** – Army participates in industry efforts.

5 **Monitor** – Army monitors industry efforts.

Example: Smart Outsourcing Questionnaire

Directions: Please place the basic technologies in the framework domains using the numbers 1, 2, 3, 4, & 5 according to the following rating scale.



1 = **Lead** - Technology has limited industry appeal. Army performs research in-house.

2 = **Join** - Technology of interest to other military or government agency. Army performs research jointly with other agencies.

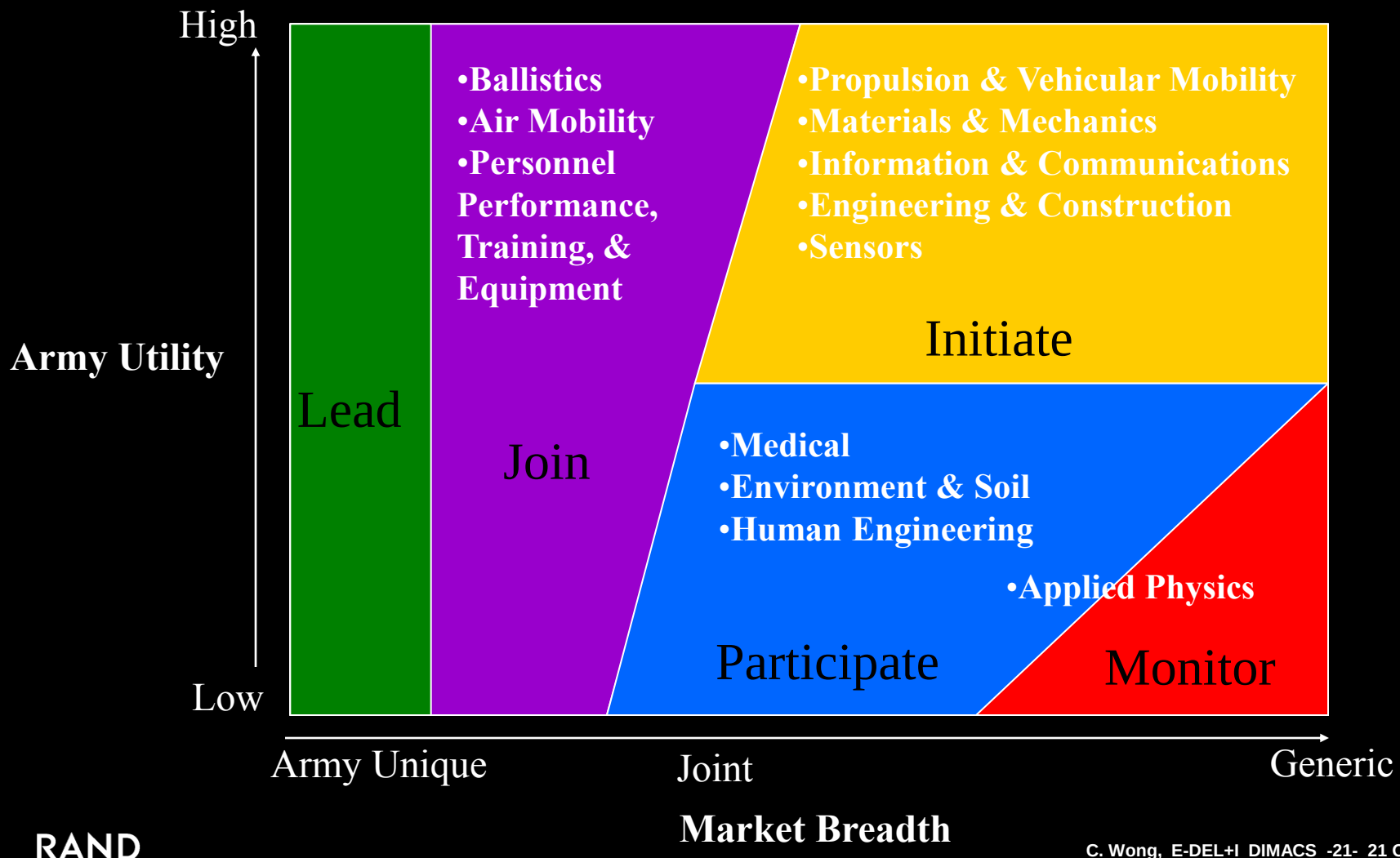
3 = **Initiate** - Technology of moderate to high Army utility appeals to industry. Army collaborates with industry in R&D.

4 = **Participate** - Technology of moderate or low Army utility appeals to industry. Army collaborates with industry in R&D.

5 = **Monitor** - Technology of moderate to low Army utility has high industry appeal. R&D performed by industry with little or no Army resources.

			Statistical Feedback from Round 1 Responses		
FY2001 Army Technology	**Domain**	**Rationale**	**Mode(s)**	**Mean**	**Median**
Propulsion & Vehicular Mobility			3	2.615385	3
Materials & Mechanics			3	2.769231	3
Ballistics			2	1.692308	2
Air Mobility			2, 3	2.615385	3
Applied Physics			5	4	4
Information & Communications			3	3	3
Medical			3	3.538462	3
Engineering & Construction			3	2.923077	3
Sensors			2	2.692308	3
Environment & Soil			4	2.923077	3
Human Engineering			4	3	3
Personnel Performance, Training, & Equipment			4	2.923077	3

Example: Smart Outsourcing E-DEL+I Exercise Results



Selected E-DEL+I Applications

- **Development of smart outsourcing strategies for the Army**
- **Identification of affordable technologies for the Army**
- **Evaluation of alternative organizational structures for Army Laboratories**
- **Assessment of alternative strategic directions for the Army**
- **Specification of investment priorities for the Navy**
- **Functional-Area Analysis for Net-Centric Operational Environment**
- **Prioritization of research needs for criminal justice community**

Consensus Building By Round: AA Exercise

Modes Based Round 1 Responses

	Criterion	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
National Priority Criteria	Robust				Consensus		Consensus
	Flexible						
	Joint		Consensus	Consensus	Consensus		Consensus
	Transformational	Consensus	Consensus			Consensus	
	Strategically responsive						
	Prompt		Consensus				Consensus
	Precise		Consensus	Consensus		Consensus	Consensus
Strategic Criteria	Likely worlds						Consensus
	Uncertainty hedge				Consensus	Consensus	
Implement Criteria	Technological Maturity	Consensus					Consensus
	Affordability	Consensus					
	Personnel / Training Stability						Consensus
	Survivability		Consensus				Consensus
	Operational Durability						

Modes Based Round 2 Responses

	Criterion	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
National Priority Criteria	Robust	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Flexible		Consensus	Consensus	Consensus	Consensus	Consensus
	Joint	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Transformational	Consensus	Consensus			Consensus	Consensus
	Strategically responsive	Consensus				Consensus	
	Prompt	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Precise		Consensus	Consensus	Consensus	Consensus	Consensus
Strategic Criteria	Likely worlds	Consensus	Consensus	Consensus	Consensus		Consensus
	Uncertainty hedge			Consensus	Consensus	Consensus	Consensus
Implement Criteria	Technological Maturity	Consensus	Consensus	Consensus	Consensus		Consensus
	Affordability	Consensus		Consensus	Consensus	Consensus	Consensus
	Personnel / Training Stability	Consensus					Consensus
	Survivability		Consensus	Consensus	Consensus		Consensus
	Operational Durability	Consensus		Consensus	Consensus		Consensus
	Organizational Feasibility						Consensus
	Adaptability						Consensus

Modes Based Round 3 Responses

	Criterion	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
National Priority Criteria	Robust	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Flexible	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Joint	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Transformational	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Strategically responsive	Consensus		Consensus		Consensus	
	Prompt	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Precise	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
Strategic Criteria	Likely worlds	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Uncertainty hedge		Consensus	Consensus	Consensus	Consensus	Consensus
Implement Criteria	Technological Maturity	Consensus	Consensus	Consensus	Consensus		Consensus
	Affordability	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Personnel / Training Stability				Consensus	Consensus	Consensus
	Survivability	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Operational Durability	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Organizational Feasibility		Consensus	Consensus	Consensus	Consensus	Consensus
	Adaptability			Consensus	Consensus	Consensus	Consensus

Modes Based Round 4 Responses

	Criterion	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
National Priority Criteria	Robust	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Flexible	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Joint	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Transformational	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Strategically responsive	Consensus	Consensus	Consensus	Consensus	Consensus	
	Prompt	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Precise	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
Strategic Criteria	Likely worlds	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Uncertainty hedge	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
Implementation Criteria	Technological Maturity	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Affordability	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Personnel / Training Stability			Consensus	Consensus	Consensus	Consensus
	Survivability	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Operational Durability	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus
	Organizational Feasibility		Consensus	Consensus	Consensus	Consensus	Consensus
	Adaptability	Consensus	Consensus	Consensus	Consensus	Consensus	Consensus

Combining Adjacent Positions: NIJ Exercise

Modeling and Simulation Research Effort	Priority Criterion						
	Value	Funding	Schedule	Risk	NIJ	MS	Cost
Effort 1	Significant	Reasonable	1 - 2 years	Low	Medium-high	Good fit	Reasonable
Effort 2	Significant	Reasonable Expensive	2 years	Medium-low	Medium-high	Excellent fit	Moderate
Effort 3	Significant	Moderate	2 years	Medium-low	Medium-high	Good fit	Reasonable
Effort 4	Moderate	Moderate	1 year	Medium-low	Medium-high - Highly unique	Acceptable - Good fit	Reasonable - Low
Effort 5	Moderate	Expensive	3 - 2 years	Medium-low	Medium-high	Excellent fit	Moderate
Effort 6	Significant	Moderate	3 - 2 years	Medium-low	Medium-high - Highly unique	Excellent fit	Reasonable
Effort 7	Moderate	Moderate	2 years	Medium-low	Highly unique Medium-low	Good - Acceptable fit	Reasonable
Effort 8	Significant	Moderate	3 years	Medium-low	Medium-high	Good fit	Reasonable
Effort 9	Moderate	Expensive	2 years	Medium-high	Medium-high	Excellent fit	Reasonable

Legend

Text color and: Consensus position; 50% position - Adjacent postion; Bi-polar Positions

Base cell color dominant, line color strong defenses

Color scale: Best | Good | Fine | Fair | Workable | Ambitious | Challenging

Explanations of Assessments: Navy Exercise

Written Responses Received for Navy Science and Technology E-DEL+I Exercise

Round	Expert	Dimension	Project	Assessment	Explanation of Assessment
1	SME1	Status	Project 1	Problems; Inexperienced team	This proposal blends existing data centric environments. The proposed "active" solution looks like an intelligent agent approach. Broad success in that milieau requires an information centric computing environment. I read neither any expertise in that area and challenging technical issues. Further, real Navy places with real competence in this area(SPAWAR, FNMOC, etc) are alrady working solutions, why research it more, when we need to "just do it?"
1	SME 2	Status	Project 2	Problems; Experiened team	Emerging standards raise technical questions.
1	SME 2	Status	Project 3	No problems; Experienced team	Seems like they have a good handle on this. I recommend they get a hold of Checkmate Farms, a small start up that is working three different ways to increase symbols/Hz, each by a magnitude of ten, and together additive, so potentially 1000 times more symbols/Hz
1	SME 2	Status	Project 4	Problems; Experiened team	Obviously an experienced team, but if it was techncially easy, it wou d have been solved years ago; they've been working this forever.
1	SME 2	Status	Project 5	Problems; Inexperienced team	We talk of relying on COTS, but this isn't a COTS problem. It will be difficult, but it needs doing.

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Lessons Learned

- Design of expert panels should be based on balance in dimensions
- Sensitivities to influence might need to be addressed
- Multiple round exercises that are conducted over a period of time may require advanced buy-in from participants
- Post-exercise attribution of positions may be sensitive
- Design rating scales that make sense to the participant
- Mode is generally the correct statistic for consensus
- Consider natural risk adverse responses when constructing rating scales
- Input request medium should be distributed in protected mode
- Live real-time discussion sessions can be challenging to schedule if multiple time zones are involved

Selected E-DEL+I References

- ***An Analysis of Collaborative Research Opportunities for the Army*, MR-675-A, RAND Corporation, 1998**
- ***How Will the e-Explosion Affect How We Do Research?*, DB-399-RC, RAND Corporation, 2003**
- **"An Approach for Efficiently Managing DoD R&D Portfolios," *Acquisition Review Quarterly*, Fall 1998**
- ***Applicability of Alternative Organizational Models to Army Laboratories*, DB-347-A, RAND Corporation, 2001**
- ***Portfolio Analysis and Management for Naval Research and Development*, MG-271-NAVY, RAND Corporation, 2004**

Summary

- **Informed decisionmaking is difficult**
- **E-DEL+I technique facilitates informed decisionmaking**
  - **Minimizes cost and logistical burden**
  - **Maximizes objectivity**
  - **Incorporates built-in flexibility**
  - **Tailored to application**
- **E-DEL+I has been successfully used to define ways forward in a variety of projects**

For more information on the E-DEL+I Analytic Technique contact

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