



# Improving Analytical Support to the Warfighter: Campaign Assessments, Operational Analysis, and Data Management

## Working Group 5 *Current Operations Analysis – Strategic & Operational Level*

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# WG 5 Goals

- Enhance the capability of OR analysts at combatant commands, JTF headquarters, the armed services, and the national defense department/ ministry level
- Share *best practices* and information regarding models that have proven useful at the *strategic or operational level*
- *Address gaps* in modeling and analysis capability through an examination of which models analysts are using and what kinds of problems analysts are asked to solve



# WG 5 Approach (1/2)

- **WG framework based on 4 questions:**
  - What questions do analysts address?
  - What techniques, tools & models do analysts use?
  - What questions have analysts been unable to answer with currently available tools, models and resources?
  - Do other tools, models, or resources exist that could be used to answer those questions?



# WG 5 Approach (2/2)

- Briefings to share Operational and Strategic level analyses
  - Support to ISAF through CENTCOM: Multi-Model Analysis – Dr. Brian Efir, NDU
  - History of Center for Army Analysis Irregular Warfare Database & Applications – LTC Dave Sanders, CAA
  - Using Wargaming & Empirical Data to Address Strategic Issues – LTC Dave Sanders, CAA
  - IW Analysis in UK Defence Community – Mr. Luke Huxtable, Defence Science and Technology Laboratory, UK
  - Campaign Assessments, Ops Analysis & Data Management – LTC(P) Clark Heidelbaugh, JIEDDO COIC
  - Casualty Estimate For USCENTCOM, Patterns-of-Operations Basis (Benchmark Rate Structure) – Mr. George Kuhn, LMI
  - Adaptive Forecasting Methods to Predict Enemy Actions – Maj Brad Young, USCENTCOM J8



# WG 5 Findings (1/7)

- What questions do analysts address?
  - Force Structure/Force Development
    - Required size & mix of Coalition Forces / National Security Forces\*
    - National Security Force development capability
    - Coalition Force drawdown analyses
  - Size, nature, composition, & objectives of insurgent groups
  - Campaign analysis
    - COA Analysis
    - Durations
    - Probability of success\*
    - Casualty estimation\*

\*WG presentation topic



# WG 5 Findings (2/7)

- **What questions do analysts address?**
  - Predicted impact on popular sentiment of coalition force growth / reduction\*
  - Threats:
    - Trend analysis & impact on operations
    - Understand & defeat the network\*
  - Effect of stabilisation operations on:\*
    - Governance / essential services
    - Changing security environment
    - Economic / Employment
    - Rule of Law / Security Sector Reform
    - Strategic Communications
    - Information Operations

\*WG presentation topic



# WG 5 Findings (3/7)

- What techniques, tools & models do analysts use?

<p><b><u>Techniques:</u></b>  <b>Game Theory</b>  <b>War Gaming</b>  <b>Optimization</b>  <b>Influence Diagrams</b>  <b>Field Anomaly Relaxation</b>  <b>Survey Analysis</b>  <b>Social Network Analysis</b>  <b>Computational Linguistics</b>  <b>Multi-attribute Utility Theory</b>  <b>Nodal Network Analysis</b>  <b>Systems Dynamics</b>  <b>Geospatial Analysis</b>  <b>Pattern &amp; Cluster Analyses</b>  <b>Risk Analysis</b>  <b>Statistical Analysis</b>  <b>Forecasting</b>  <b>Statistical Process Control</b>  <b>Agent Based models</b></p>	<p><b><u>Tools:</u></b>  <b>Bayesian Networks</b>  <b>MS Excel / Access</b>  <b>Statistical tools</b>  <b>GIS Tools</b>  <b>Stella</b>  <b>SABERS</b>  <b>Computer Algebra Systems</b>  <b>Scripting / Programming Languages</b></p>
	<p><b><u>Models:</u></b>  <b>PSOM (Peace Support Operations Model)</b>  <b>STOAT (Stabilisation Operations Analysis Tool)</b>  <b>IWQAD (IW Quantitative Analysis of Database)</b>  <b>MEESSSEE (Modeling Effects of Essential Svcs, Security, Economics &amp; Employment)</b>  <b>Senturion</b>  <b>Cultural Geography</b>  <b>ICAF (Interagency Conflict Assessment Framework)</b></p>



# WG 5 Findings (4/7)

- What questions have analysts been unable to answer with currently available tools, models and resources?
  - Analysts provide the best answer possible given time, resources and expertise.
  - Reachback/external support is critical for success.
  - Resource challenges:
    - Getting the right tools on the right network when needed
    - J2 – ORSA integration
    - Getting Data



# WG 5 Findings (5/7)

- Do other tools, models, or resources exist that could be used to answer those questions?
  - Social network analysis
  - Interdisciplinary/interagency interactions
  - Data – challenges to overcome:
    - Data availability, transfer and authoritative data repository
    - Data sharing with Coalition partners
    - Data Aggregation/Disaggregation
    - Data Context (e.g., blue force activity)
    - Coalition data at the tactical level (who, what, when, where, why and how)
    - Variable resolution; nesting; scaling
    - Vertical and horizontal integration
    - Civilian, socio-economic, corruption data



# WG 5 Findings (6/7)

- What are the questions that need to be answered by the analysis community regarding your specific focus area in analytical support to the warfighter?
  - How do we account for interrelationships, influence, and 2nd & 3rd order effects of non-military issues (e.g., socio-economics, corruption) with regard to campaign objectives?
  - How do we improve access to in-theater data?
  - How do we use data, information and analysis from the tactical level to inform operational and strategic support to decision makers?



# WG 5 Findings (7/7)

- What types of analysis and what tools/models are required to help the community answer the questions regarding your focus areas, and do they currently exist?
  - Multi-resolution modeling
  - Tools to collect, process, manage and interrogate data
    - Coalition data at the tactical level
    - Creating structured data from unstructured data
  - Need to integrate civil/economic/institutional modeling and military modeling
  - Analysis of Phase 0 COAs – e.g., assisting with economic, water, and energy interests to prevent need for future engagement



# WG 5 Recommendations (1/2)

- Educate analysts on:
  - Importance & process of defining the problem up front with the customer (objectives, background, scope, resources, timeframe, methodology, product, etc.)
  - Importance of developing & maintaining contacts within the organization (planners, intel analysts, data sources)
  - Core Competencies, best practices
  - How to be a super user in EXCEL, ACCESS, VBA, GIS
- Determine procedures, guidance & agreements for access to in-theater data
- Define requirements for data tools (collect, process, manage and interrogate)



# WG 5 Recommendations (2/2)

- Formalize Integrated Knowledge Management
  - Staff function, responsibility, resourcing
  - SOPs, Battle Rhythm
  - Networks – cross domain security policy
- Develop and socialize ORSApedia
- Focus efforts on developing models incorporating the P\_ESII aspects/impacts in IW
- Broaden analysts' focus:
  - Interdisciplinary
  - Interagency
  - Improve integration with theater planners & other experts (e.g., intelligence)
- Utilize and communicate analysis plans.



# WG 5 Summary

- Great diversity of experience and perspective in WG 5.
- Little emphasis on traditional M&S. Identified a breadth of other tools and methods in use.
- Data, data, data.
  - Always want more
  - Need to develop methods to do without  
(Lack of data, sparse data, messy data)
- Interagency, intergovernmental, interdisciplinary approaches



# WG 5 Quotes

- Torture the data until it confesses.
- Get all the information you can, we'll think of a use for it later.
- That seems really simple.
- 3 of the 4 countries represented here agree...
- There are no pocket protectors here.