Refinement of Wargames in the Wargaming Life Cycle

Phil Pournelle

Presentation to the Connection UK Conference

6 September 2018

The comments presented here are strictly my own and do not represent those of the US government, the Department of Defense or any other organization.

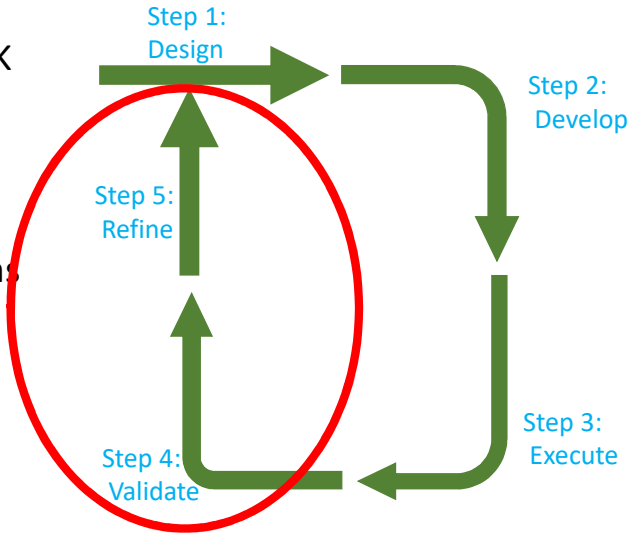
<Click> This presentation is based on my personal observations of my time in service but do not necessarily reflect the views of my former or current employers. These caveats are often referred to as weasel words, hence my mascot.

Validation & Refinement

Task Assignment from Connections UK Leadership:

- After Action Reviews
- Post Exercise Reports
- Capture and promulgation of Lessons Identified (LIs)
  - Scenario
  - Game execution
- Governance

UK Wargaming Handbook
Wargaming Process



When I was approached to make this presentation, the email specified the list of topics I should address. <Click> However, when I reviewed the UK Wargaming handbook it was evident the list of topics came from steps 4 and 5 of the UK wargaming process, which is proper given the process of validation and refinement of games are really inseparable.

Definitions

- Wargaming: Generally, a wargame is a dynamic representation of conflict or competition in a synthetic environment, in which people make decisions and respond to the consequences of those decisions (Peter Perla in May 2016).
- Wargames are representations of conflict or competition in a synthetic environment, in which people make decisions and respond to the consequences of those decisions (JP 5-0, 16 June 2017).
- Best Practices (JP 5-0 Page V-32)
  - ❖ People making decisions under uncertainty
  - ❖ A fair competitive environment
    - o the game should have no rules or procedures designed to tilt the playing field toward one side or another
  - ❖ Adjudication
  - ❖ Consequences of actions taken
  - ❖ Iterative
    - o Ideally in a cycle of research/learning as new insights will be gained as games are iterated
      - See Chapter 9 of Peter Perla's *The Art of Wargaming*, Naval Institute Press, 1990.

Before discussing each of the topics, it is important to know what I mean by the term wargame and wargaming. Fortunately, the United States doctrinal publication on the Joint Planning Process known as Joint Publication 5-0 provides a definition which closely matches one authored by Dr. Peter Perla. The publication goes on to describe best practices to employ for best effect in the conduct of a wargame. These include such things as ensuring it is truly a game with competition between at least two opposing sides with consequences of the opposing actions. Further games are most effective when conducted iteratively, whether for training, or for the development of new strategies.

General Categories of Wargaming

	Creating Knowledge	Conveying Knowledge	Entertainment
Unstructured Problem	Discovery Games	Education Games	Role Playing
Structured Problem	Analytic Games	Training Games	Commercial Kriegsspiel (E.g. Risk)

Exploratory Games

Notes: This table is a combination of two depictions. Dr. Jon Compton's "Analytical Wargaming" (Compton 2014). Elizabeth Bartels presentation, "Gaming: Learning at Play" published in OR/MS Today, August 2014. It is also noted due to the competitive nature of the commercial wargame market, these games have been the source of a lot of innovation in the mechanics of wargame design.

Even within the definition of a wargame there are many types and styles which should be properly selected from according to the larger purpose. My remarks today will focus on exploratory games devoted to the purpose of innovation and diagnosis of competitions at the national level. <Click> The games I participated in and/or designed professionally usually began with an unstructured problem and we employed games to attempt to diagnose the competition between rivals or teams of rivals. As we gained understanding of the problem, the insights enabled us to create structures or hypotheses, adding rules and strategies as we went along.

Why are we doing this?

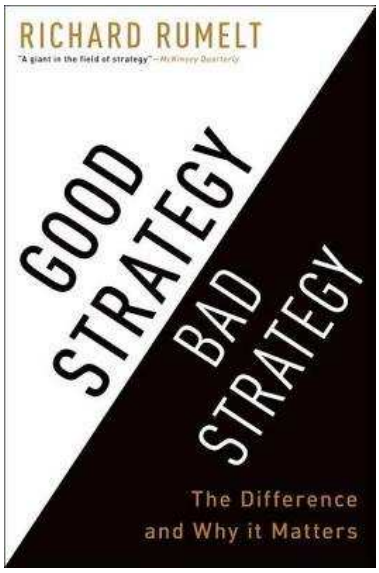
"A good strategy is, in the end, a hypothesis about what will work."

"A good strategy has at a minimum, three essential components:

- a *diagnosis* of the situation,
- the choice of an *overall guiding policy*,
- and the design of *coherent action*."

"In general, strategic leverage arises from a mixture of anticipation, insight into what is most pivotal or critical in a situation, and making a concentrated application of effort… The most critical anticipations are about the behavior of others, especially rivals."

➢ Richard P. Rumel, *Good Strategy/Bad Strategy*, 2011



Why are we doing all this? Because some day in the future someone in the field will have to take actions and she or he will not have time to think about it. They will have to act on the doctrine developed and assessed by analysts before hand. Hopefully, they will also have participated in training games which will enable them to recognize what is occurring and employ the correct solution to the problem.

The purpose of the work I was doing and what I think the UK Wargaming Handbook is intended to do is to develop effective strategies to successfully address the challenges of the changing modern and future environment. This environment includes changes in state and non-state actors, new technologies and innovations, new approaches to the competition, not to mention a multi-polar environment reminiscent of the era of the "great game" but now with far more destructive weapons.

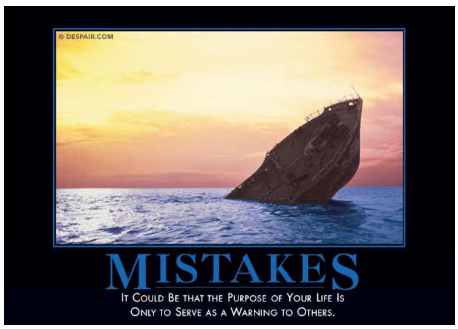
To build these new strategies requires a thought experiment laboratory where we make an effort to emulate the real world environment, observe what occurs in our emulation, generate some initial hypotheses of what will work and conduct some initial tests on them. As so eloquently stated by the UK Vice Chief, these thought experiments need to be conducted in a "Safe to Fail" environment, multiple times. Further once the proper diagnosis and solution are identified, those who must execute the solution in the field must also be given a "Safe to Fail" environment to practice in.

All of this requires the development of strategies, each a hypothesis of what will work, subjected to at least a thought experiment.

Jon Compton's Purpose of Wargaming

- *The purpose of an analytical wargame is not to answer any specific question with a point solution. Its purpose is to gain insight into complex questions in order to generate a better analytical focus, be it at the strategic, operational, tactical, or some other level of analysis.*
- To wit:

  hypothesis generation within a cycle of research.



My father was an Operations Analysts who firmly believed the purpose of an analyst was to draw out the hypothesis or theory of victory from the mind of a commander and then go off and test it, particularly the underlying assumptions and then bring back the results. This requires understanding the context of the commanders theory. I can think of no better mechanism to draw these out then a wargame and Jon Compton seems to agree.

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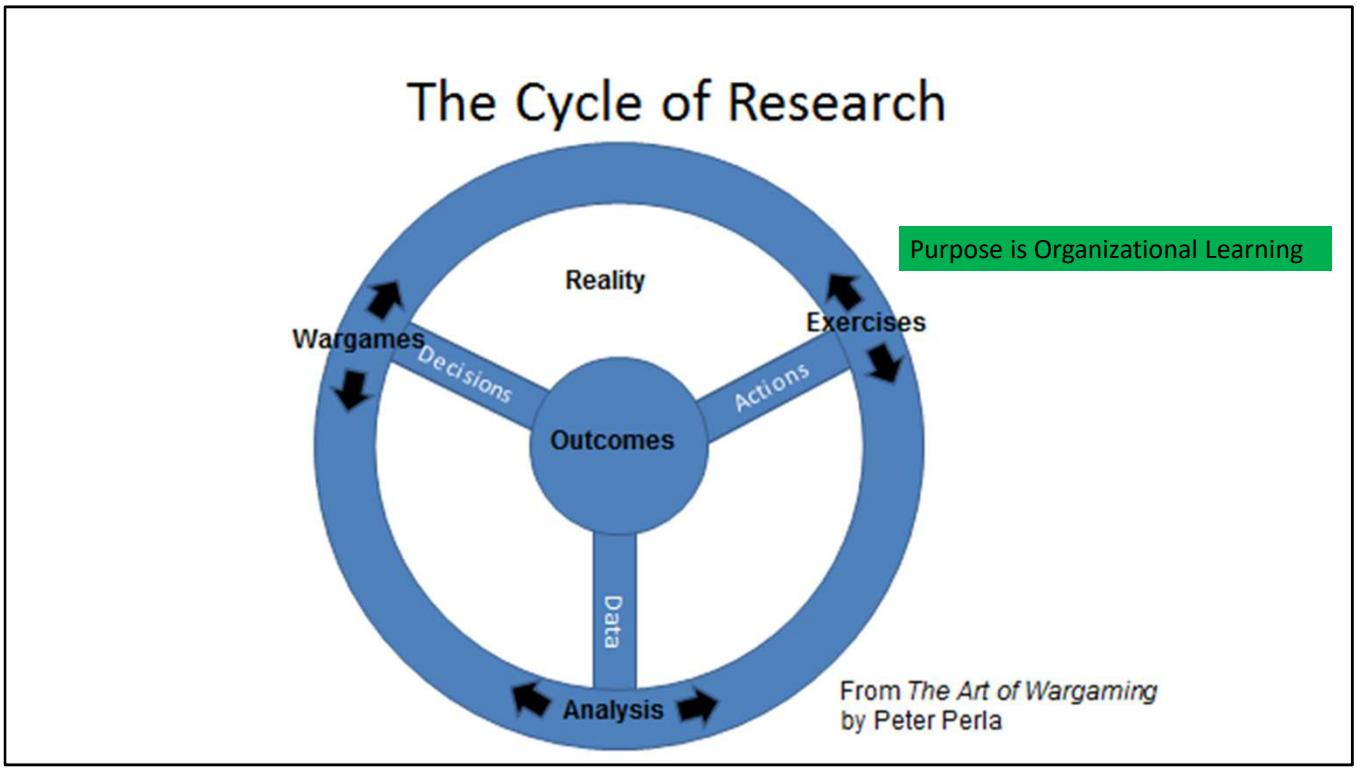
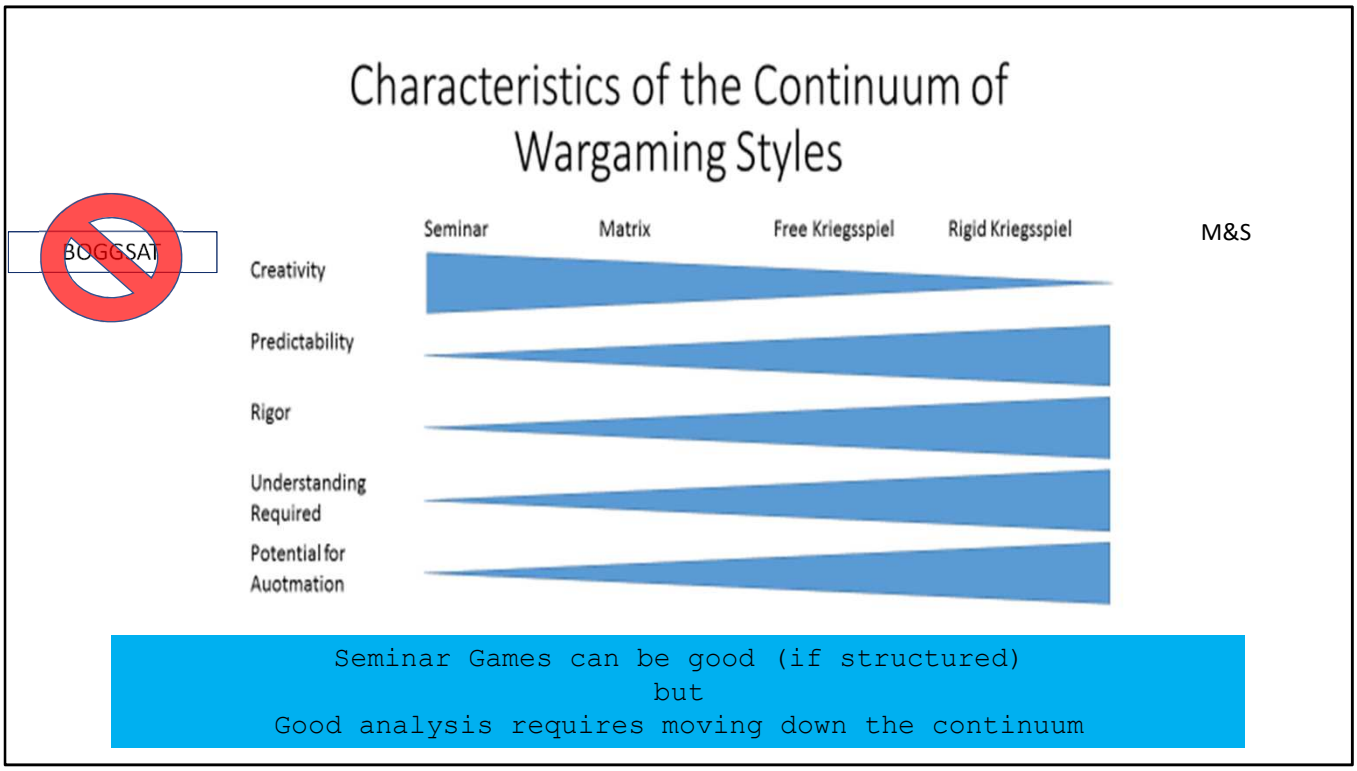
But any hypothesis of a competition must address the fact the opposing commander has his own theory of victory and the choices of the two sides will have a large impact on the outcome of the competition. The Russian and Chinese military doctrine is based on Dialectic Materialism which embraces this concept.



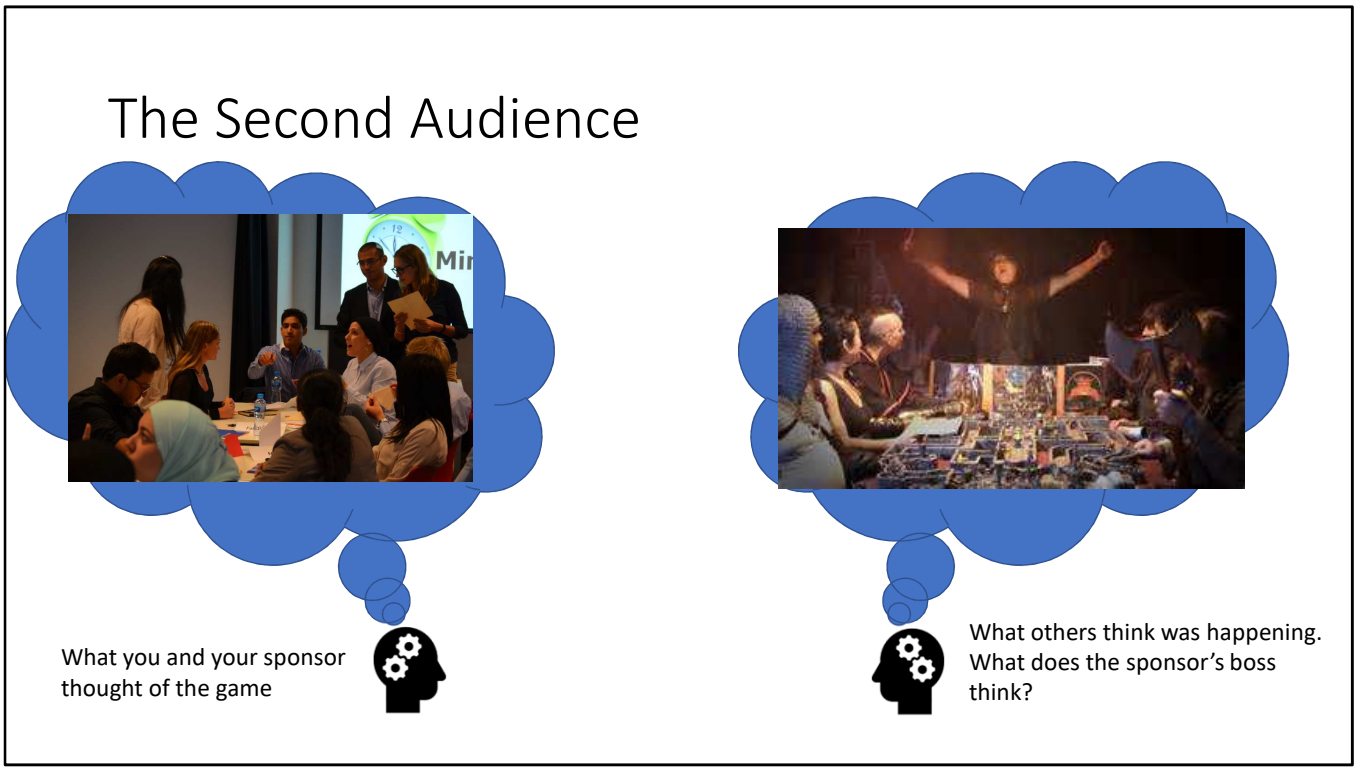
Einstein tells us science tells us the way the world is, while religion tells us how it should be. Peter Perla's Cycle of Research is designed to gain the best of each of the tools available to us. Each element complementing and making up for the limitations in each of the others. Wargames gives us an idea what we could do. Analysis tells us how best to do it. While real world exercises tells us if it can actually be done. <Click> In the end, the cycle of research serves the purpose of organizational learning to identify the best strategies. Wargames are the critical spark in the generation of theories of victory.



Based on Peter Perla's work and after being introduced to Matrix style games by the leadership of this august group, a theoretical construct of how we should employ the right style of games according to how well we understand the interactions between the competitors came to mind. Each stage in the continuum is based on how well the phenomenology has developed. Now I suggest this continuum provides not only an assessment of the current state but also a roadmap on where we must go. <Click> Too many of us have suffered through events calling themselves wargames but were not more than a Bunch of Guys and Gals Sitting Around a Table or BOGGSATs. These unguided discussions can be an incredible wastes of time and talent, usually because they lack the key elements of a real wargame; they lack decision and consequences of interactions.

Even when these basic elements are met, these games fail to meet the larger purpose of increasing our understanding of the problem; they fail to develop the phenomenology of areas of the competition. Fairy dusting a problem with the magic of cyber or information operations does not advance our understanding. Therefore, in each of the iterations of wargames in the cycle of research, game designers must attempt to increase the rigor in how to adjudicate actions in these fields. Who did what to whom? How? To What effect? Etc. These questions must be addressed and the game mechanics expanded to capture these factors in each iteration and recorded.

<Click> It is very troubling to see analysts attempt to jump from the generalities of seminar war games to implement a computerized Model & Simulation (M&S). As a qualified M&S modeler I can tell you this is not valid as M&S requires the programmer to fully understand not only the phenomenology but also the probable actions of the opposing sides. Therefore, to do M&S properly the analysts must move down the continuum to where the phenomenology is effectively captured in Rigid Kriegsspeil rules. Since in most cases the computer can only do what it is told, the simulation must also capture the probable actions and interests of the opposing sides. My experience with the emulation of our competitors has made clear to me their thought processes and their rational actor models are not the same as ours, casting into doubt the validity of many models.



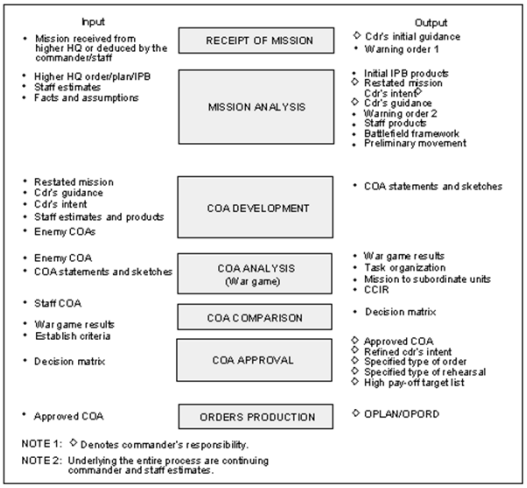
There is a fundamental reason why we need to get this right, we are professionals but many are not. I've hear of and participated in a quite a number of memorable events with a large cast of SMEs, etc. Some of these were actually wargames. But after it was all over, I wondered what did we accomplish. In some cases wargaming has rightly been castigate for creating negative learning due to a lack of realism and rigor in their execution.

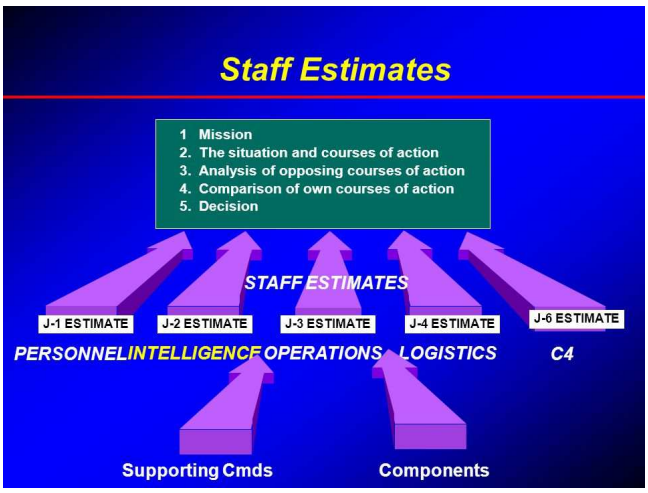
In the mind of the game designer and the sponsor it might have been a thrilling exercise, but no matter how vivid and memorable the game was in the minds of the participants, it will not exist beyond their departure. <Click>

Peter Perla has warned us of the sinusoidal pattern of interest in wargaming over the years. One element of each of the downward trends in the pattern is the concern of other analysts that all we are doing is playing a version of Dungeons & Dragons and having a great time, but not adding any value, or in some cases creating negative value. I can tell you with the departure of our champion, Bob Work, from the Pentagon, there are already forces at work attempting to redirect resources away from wargaming to "better purposes."

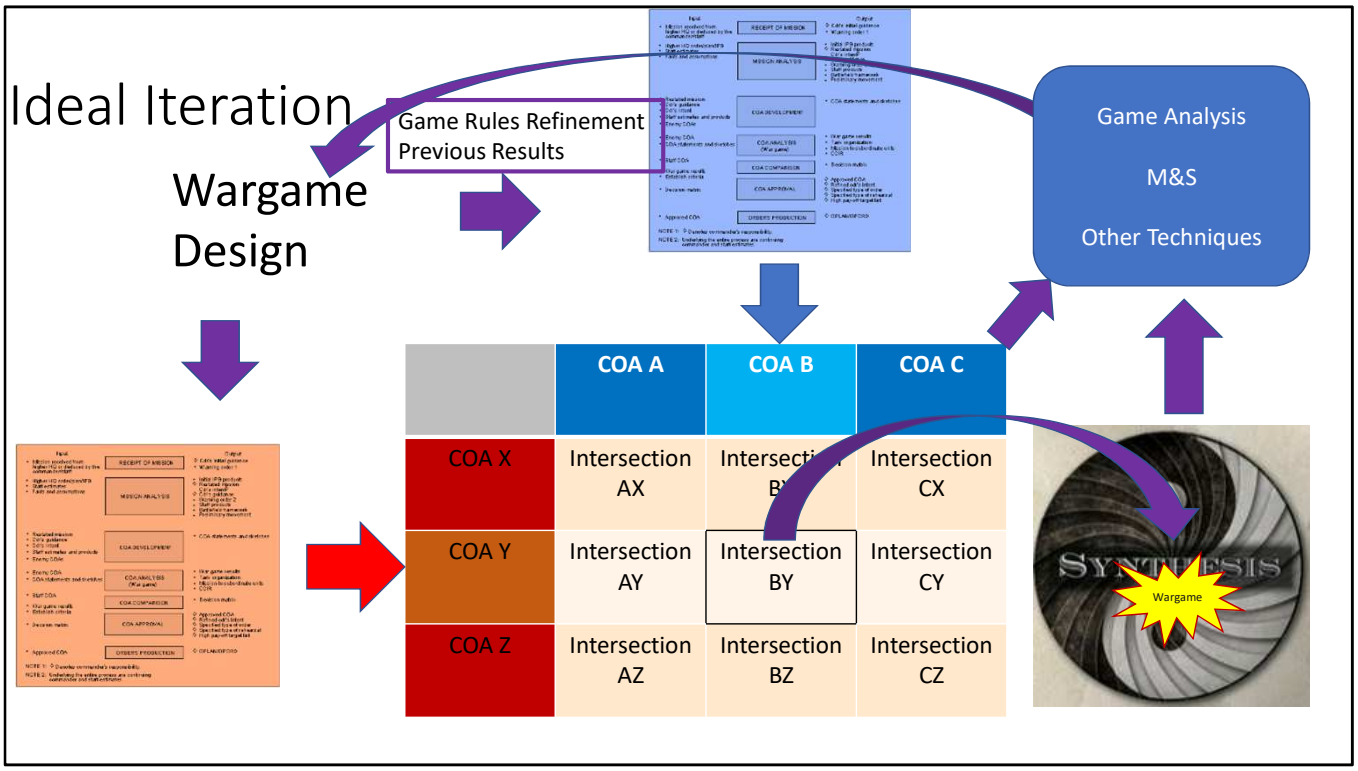
So now, it is critical that we police ourselves and act as professionals. The mark of a professional community, is one that conducts a critical assessment and records what occurred, reporting insights gained and advances its best practices.

Joint Planning Process Prior to Playing Game





With all this in mind, what would the ideal analytic wargame look like? First it would require players to employ a doctrinal planning process before the game begins. Here are illustrations of the US joint planning process, including the critical staff estimates. Employing the Planning Process ensures teams are employing a coherent plan with due regard for realistic executability of the plan. Far too often, games are an ad hoc collection of unassociated players who make up their moves as they go along, this does not help anyone. Note that within the planning process is the simple COA Wargame to be conducted by the teams, the more sophisticated game awaits them after completion of their planning.



Here we illustrate Red and Blue teams conducting their own Joint Planning Process, including the design of three Courses of Action, and selection of one COA. The two teams then execute their selected plan in the wargame with consequences for their actions and will need to adjust their plans as the game is played.
<Click> Upon completion of the game, rigorous analysis should occur, including instantiation of the two plans into Campaign Analysis Models and Simulation and or other techniques as available and appropriate. Using these should gain improvements of the understanding of the conflict including factors such as chance.
The planning process and the wargame should also provide a rich data set in the 3 X 3 interaction action matrix for additional modeling or analytic scenarios.
<Click> Further the analysts will then have the opportunity to refine their adjudication techniques for the next game. The refinements, results of previous games, and insights gained from analysis of the 3 X 3 interaction matrix should then be briefed to the teams in preparation for their Joint Planning Process in the next iterative game.
Of course if you know Red's doctrinal planning process and have players who can replicate it, they should employ Red's planning process in place of the US Joint Planning Process.

Post Game Lesson Capture

Rapporteurs

- Critical element of your data collection plan
  - Don't Skimp
- What Training did you provide them?
  - Play role in test game

Survey

- Advantages
  - Independent views on the topic
  - Fresh in mind
    - If game done well, vivid imagery
    - Context
- Disadvantage
  - Players are tired
  - Travel/Dinner plans
  - Participants are notorious for not filling out surveys
    - Keep them short

Hotwash

- Advantages
  - Players are generally interested in discussing their views with group
  - Synergy of discussion
- Disadvantages
  - Dominant voices crowd out others

Structured Analytic Techniques

- Silent Clustering
- Advantage: very thorough & limits biases
- Disadvantage: Time

Assuming you've conducted the ideal iterative game, here are some suggestions and examples of how to analyze a wargame and what to record in your post game report. Here are four approaches that I know have been successfully employed, usually some combination of them. Each have their advantages and disadvantages.

The first is the use of Rapporteurs, often derogatively referred to as fancy note takers. I think Rapporteurs are a crucial element of any professional wargame and I'm sad to report that too often I've seen organizations who call themselves professionals quickly remove them as a cost saving measure. Rapporteurs are a crucial element of any data collection plan in a game, but to be valuable they need to be trained. They need to understand the terminology the participants are going to be using. This is why quite often when I run a test game, I thrust the Rapporteurs into the role of the players they will be monitoring during the actual game.

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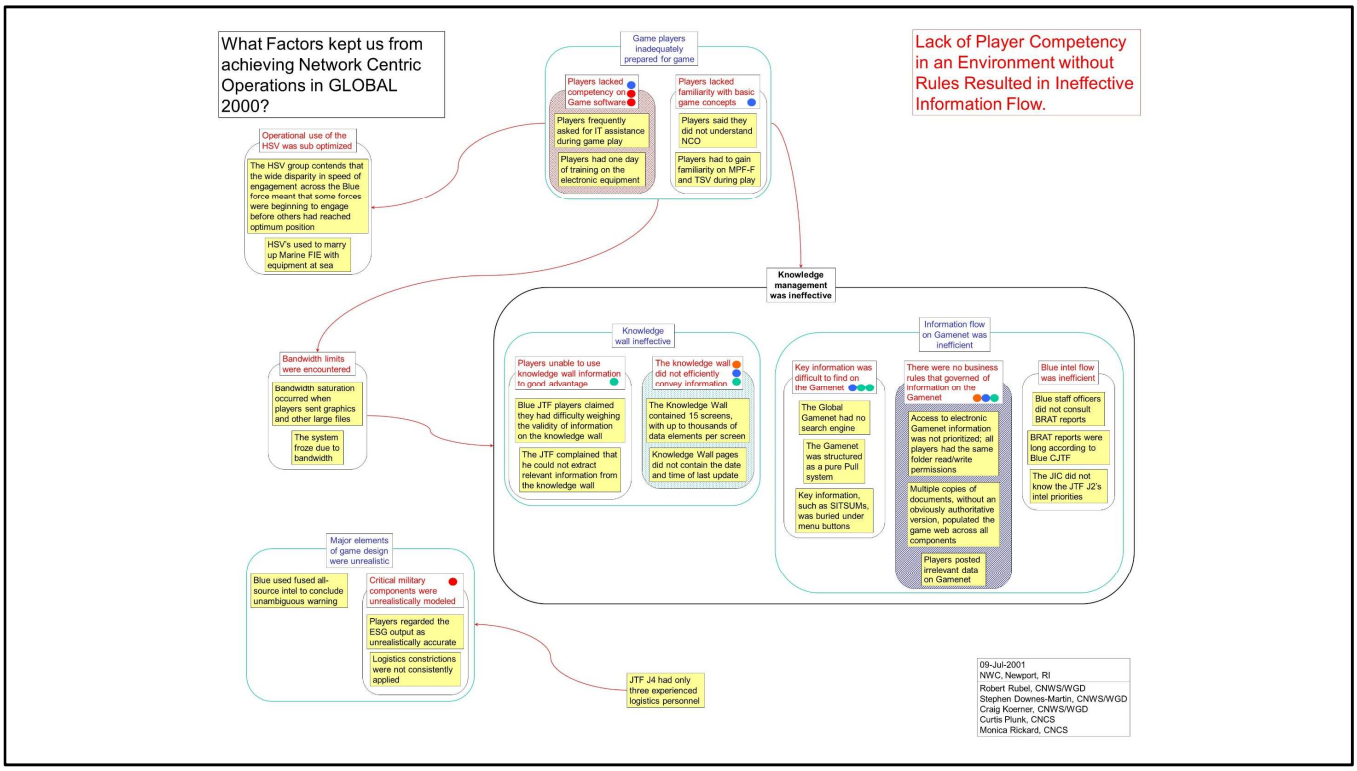
Surveys are valuable particularly when players are given them immediately after a game has concluded. As each participant still has the game fresh in their mind, but before the hotwash begins, you can obtain their independent views of the game while the context is still fresh. However, players as often tired, particularly after a three day game, they are distracted by thoughts of travelling home or eating dinner. Players are also notorious for not filling out surveys, particularly if there is any time between the game and filling it out. So keep the survey short and don't let them leave the room until they complete it.

Inevitably there will be a desire to conduct a hotwash, to get the group talking about their experience. For games that have been conducted well, players are often impatient to discuss their experiences. The best questions are when one side asks their opponents (sometimes partners), "What were you thinking when you did X?" You can often get great synergies in the discussion. However, you may also find the dominant voices drowning out others. This is why I recommend the Survey followed by the hotwash.

Stephen Downes Martin recommends forgoing the survey and the hotwash and employ a Structured Analytic Technique instead, in this case a silent clustering drill to guide the discussion. This technique encourages divergent thinking prior to convergence analysis, avoiding many of the pathologies of brainstorming.



Here is an example of the silent clustering technique which was employed in the Global 2000 wargame. It started with a question directed towards the purpose of the game, Network Centric Operations. Each player wrote down their answer on a yellow sticky note and silently placed it on a knowledge board. Then each made an effort to group the sticky notes based on their content, silently. Only after this was done was a guided discussion conducted to relate the groups together and come up with an overall assessment of the answer to the question.

Survey Questions

- What did you see as the most critical event in the game, the event which drove the narrative of the outcome of the scenario?
- What was the most surprising insight you gained in the course of the game?
- What did you like about the game?
- What did you not like about the game?
- Did you observe an event that you thought was not properly adjudicated? What was it? What was it about the results you thought were inaccurate or implausible?
- Any other comments?

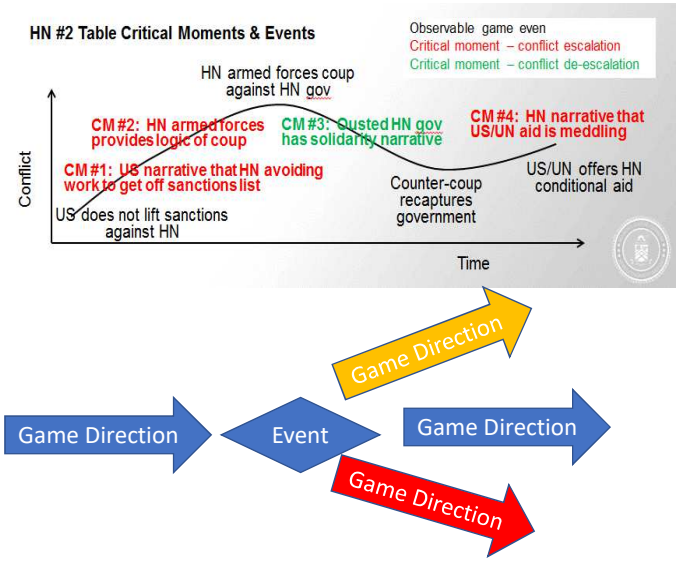
In the vein of keeping the survey short, and in my case directed towards the concept of the wargaming continuum, I offer this list of questions. I'm certain other members of this group can provide their own list. But again I caution towards keeping your list short.

Analyzing the Game – Critical Event Analysis

Rapporteurs Report:

- What actions did the player/team consider?
- Which one did they select?
- Why? What was their theory of victory?
  - ➢ What was their strategy?
  - ➢ Hypothesis of what would work?

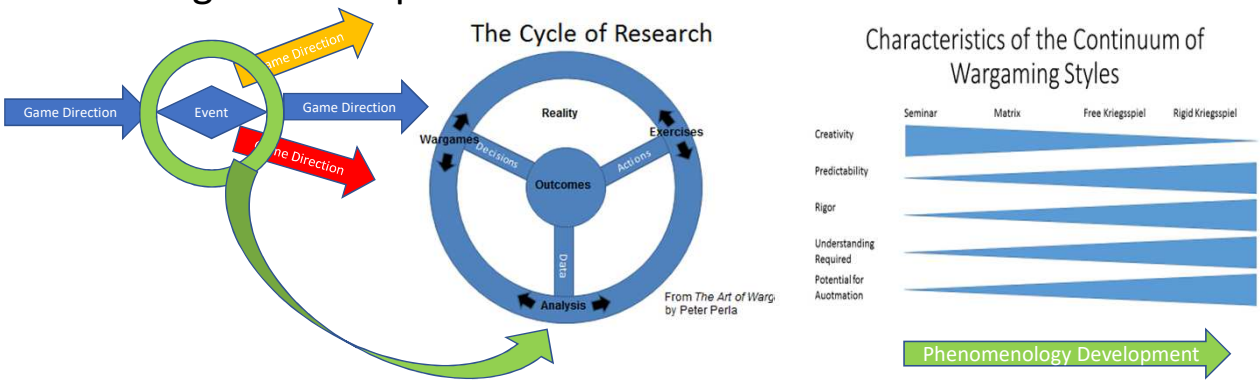
- Critical Event – An observable event in the game which changed the direction of the game or had a significant impact on the outcome
  - Often challenges widely held assumptions



There are many ways to analyze a game. Here I will demonstrate how I employ Critical Event Analysis in support of the cycle of research. Rapporteurs are critical in the data collection plan. They are tasked with recording the deliberations and actions of the teams with a focus on the range of actions the teams considered, the action they chose to take, and the rational behind it. Hopefully, we can obtain explicitly or implicitly the teams' strategy, their theory of victory, their working hypothesis of what would work. <Click> The data collection plan should also capture the flow of events in the game. <Click> This flow will change based on the choices of the opposing sides and probably based on some form of adjudication. There will be many of these, the challenge will be to identify which event was critical to the flow of the game, but I cheat, I ask the players what they thought was the most important event was in my survey. Now I know where to start when I conduct my analysis step in the cycle of research.

Importance of Iteration

- Advance Phenomenology
- Improve Game Design
- Diagnose Competition

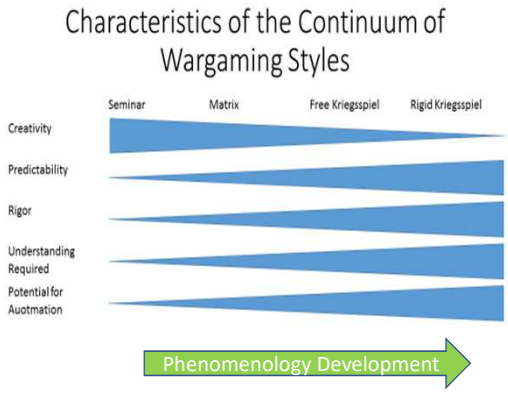


The importance of iteration is three fold. First, by running a game with a group of Subject Matter Experts you can gather understanding of phenomenon the competition is taking place across. Hopefully, you will conduct some analysis of this and determine new rules to implement this understating and improve your game design. The larger process should then enable you to diagnose the competition and develop effective strategies.
<Click>Therefore, after a game is completed you should identify the critical events that drove the game. <Click>These are the hypotheses Jon Compton was talking about. Here is where you should conduct your analysis. Or if you are so lucky, you can conduct an exercise or limited field experiment in the real world.
<Click> All of this to continue the development of the phenomenology down the Continuum of Wargame Styles.

Importance of Iteration: Strategy & Doctrine Development

TASK ORGANIZATION (if changed)

1. **SITUATION.**
   a. Enemy Forces.
   b. Friendly Forces.
2. **MISSION.**
3. **EXECUTION.**
   a. Commander's intent.
   b. Maneuver.
   c. Fires.
   d. Intelligence and electronic warfare.
   e. Individual tasks.
   f. Coordinating instructions.
4. **SERVICE SUPPORT.**
   If changed.
5. **COMMAND AND SIGNAL.**
   If changed.



All of this so that one day a commander in the field can receive a short simple order which tells him what to do, how to do it, in order to achieve what results. The what, how, and why should be in doctrinal terms that he understands and based on solid analysis, including what his opponents will potentially do.

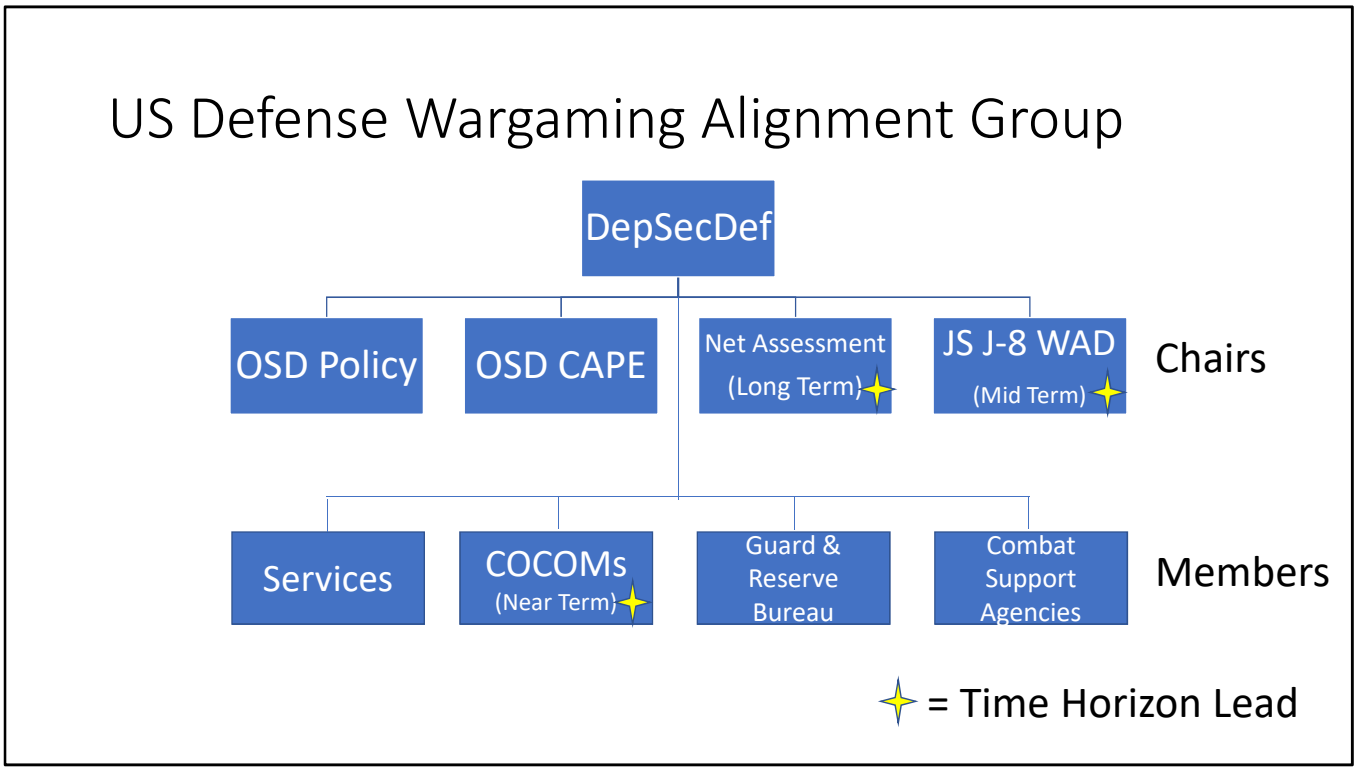
Game Series Analysis

When a large body of wargames is available, certain types of analysis can be performed. However, the wargames is a pseudo experiment on hypothetical scenarios – caveat emptor. Games in this category are rarely truly independent of each other.

- Qualitative
  - Recurring themes
  - Dominant strategies
- Quantitative
  - Effects of tactics
  - Employment of platforms and weapons systems
  - Organization or procedural ideas
    - Reference: Frederick D. Thompson 1983

While at the Office of Net Assessment I had the privilege of working with an archive of hundreds of games conducted over decades. Many, but not all, of the strategies suggested in the games were instrumental in winning the Cold War and shaped the environment we now live in.

In my examination of these archives of wargames I conducted both Qualitative and quantitative analyses. My qualitative efforts were to identify recurring themes which spoke towards a diagnosis of the overall environment or strategies that when applied seemed to dominate the competition. The Quantitative analysis was more difficult. In some cases it was how often was one side or the other effective when they applied a tactic or operational construct. Others were as simple as how often certain capabilities were employed.



The governance an iterative wargaming process is not simple. In the United States the Office of the Secretary of Defense established a body to oversee the reinvigoration and development of the American defense wargaming community. The Defense Wargaming Alignment Group, or DWAG, is tasked with improving the state of wargaming, identifying and promulgating best practices, and providing resources and lessons learned to the community.

The memo which created this organization also assigned members to take the lead on different timelines based on their organizational competencies. However, we continue to encounter limitations due to the limited number of master wargame designers available. Some interim solutions to this shortage include further collaboration between members, such as OSD CAPE running wargames for Combatant Commanders, etc. The DWAG has addressed the shortage by sponsoring Mobile Training Teams, Certification Courses, and Workshop to assist aspiring game designers on their path towards becoming master game designers.

Defense Wargame Alignment Group (DWAG)

Wargame Incentive Funds (WIF)

- 4 Threats
  - China
  - Russia
  - North Korea
  - Iran
- +1: Transnational Violent Extremism
- +3: Capability Areas
  - Cyber
  - Space
  - Nuclear

Wargame Repository (WGR)

- Must commit to providing a report to DWAG to get funds
- Report and insights go into WGR
- WGR is electronic and resides on US SIPRnet
- Over 700 wargames currently

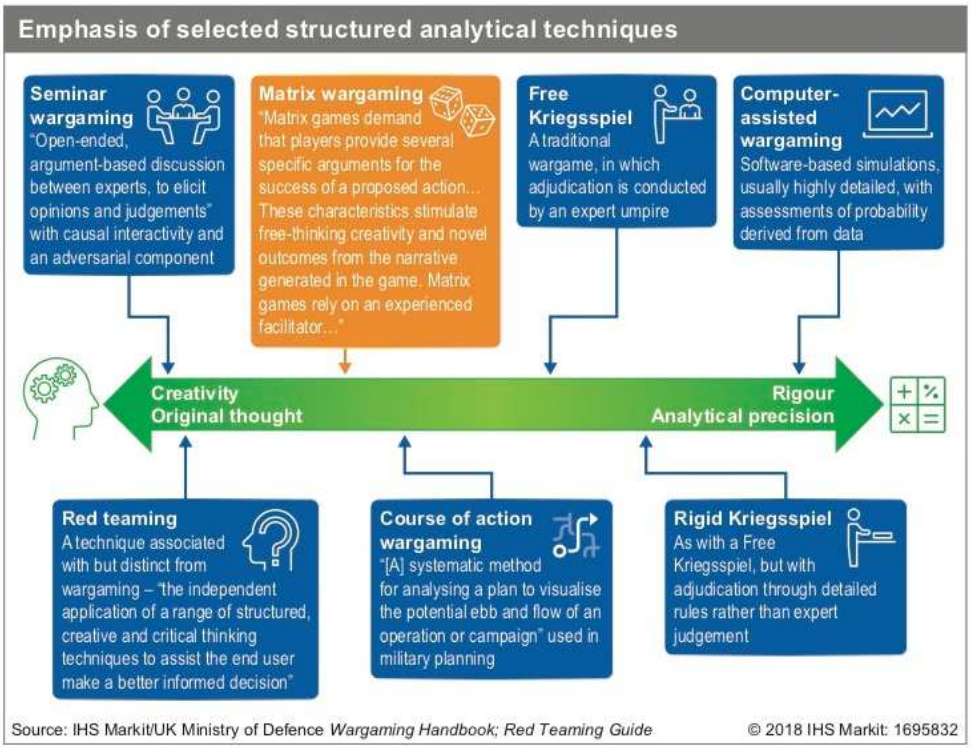
Defense One Article on Wargaming Incentive Funds, etc.
https://www.defenseone.com/ideas/2018/08/better-wargaming-helping-us-military-navigate-turbulent-era/150653/

The DWAG oversees the Wargame Incentive Funds which are applied to augment wargames within the department that address at least one of the areas of concern, particularly those which address overlaps and seams between theaters, threats, and or capabilities. These fund are prioritized towards but not solely devoted to the five major threats (4+1) and three threat capability areas (+3). To receive the funds, a DoD organization must commit to providing a report on the game (or workshop, etc.) which in turn is placed in the Wargame Repository. While the repository exists on the US Secure network, it does contain non-classified games and reports and there are efforts underway to enable access to unclassified data for war colleges and allies.

The goal is to enable the cycle of research within the department and enable new games to provide intellectual resources and points of contact, take advantage of past events, use best practices, and increase the rigor of departmental wargames.

Questions ?

I would like to prioritize the first few questions towards those asking for clarification of material I've presented.


Emphasis of selected structured analytical techniques
Seminar wargaming
"Open-ended, argument-based discussion between experts, to elicit opinions and judgements" with causal interactivity and an adversarial component
Matrix wargaming
"Matrix games demand that players provide several specific arguments for the success of a proposed action… These characteristics stimulate free-thinking creativity and novel outcomes from the narrative generated in the game. Matrix games rely on an experienced facilitator…"
Free Kriegsspiel
A traditional wargame, in which adjudication is conducted by an expert umpire
Computer-assisted wargaming
Software-based simulations, usually highly detailed, with assessments of probability derived from data
Creativity
Original thought
Rigour
Analytical precision
Red teaming
A technique associated with but distinct from wargaming – "the independent application of a range of structured, creative and critical thinking techniques to assist the end user make a better informed decision"
Course of action wargaming
"[A] systematic method for analysing a plan to visualise the potential ebb and flow of an operation or campaign" used in military planning
Rigid Kriegsspiel
As with a Free Kriegsspiel, but with adjudication through detailed rules rather than expert judgement
Source: IHS Markit/UK Ministry of Defence Wargaming Handbook; Red Teaming Guide
© 2018 IHS Markit: 1695832

Wargaming and M&S

- Wargaming: Human decision making under conditions of uncertainty (complex)

- Modeling & Simulation: Systems in competition in a complicated environment

Complementary but not the same

Narrative Analysis

- Thematic analysis – where the emphasis is on the content of the text or narrative, more so than how it is told. Themes are identified and compared between narratives.
- Structural analysis – where there is attention paid to both the themes as well as to the way the story is told. Here, the assumption is that narratives have structures and elements that can be identified and analyzed.
- Interactional analysis – with the emphasis on the process between teller and listener. Examples in this category include research on narratives in medical, social service, and court settings.
- Performative analysis – (an extension of interactional analysis) where the narrative is seen as performance. Narrative in this approach may be thought of as a form of storytelling and dialogue between characters in front of an audience.
- Catherine Kohler Reissman, *Narrative Analysis* (Sage Publications, 1993), Qualitative Research Methods Series 30, p. 18.