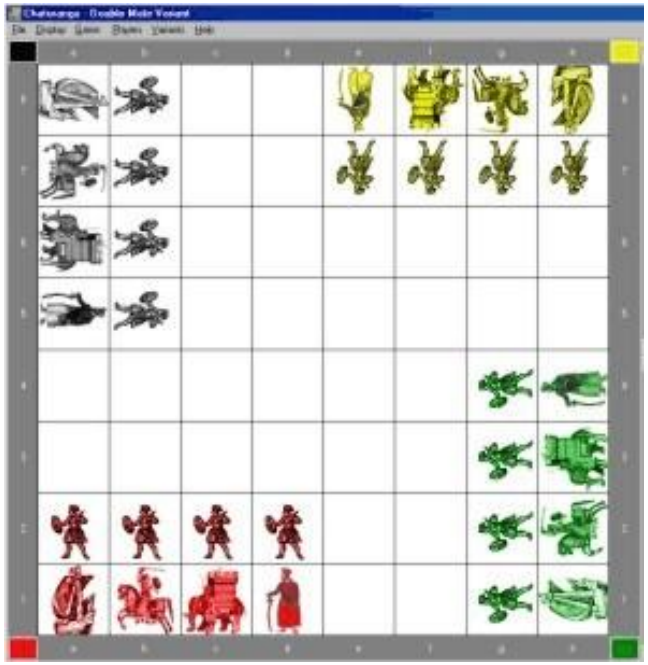
STRATCOM
Introduction to Wargaming Course
Monty Python Abbreviated History of Wargaming

Discussion Points

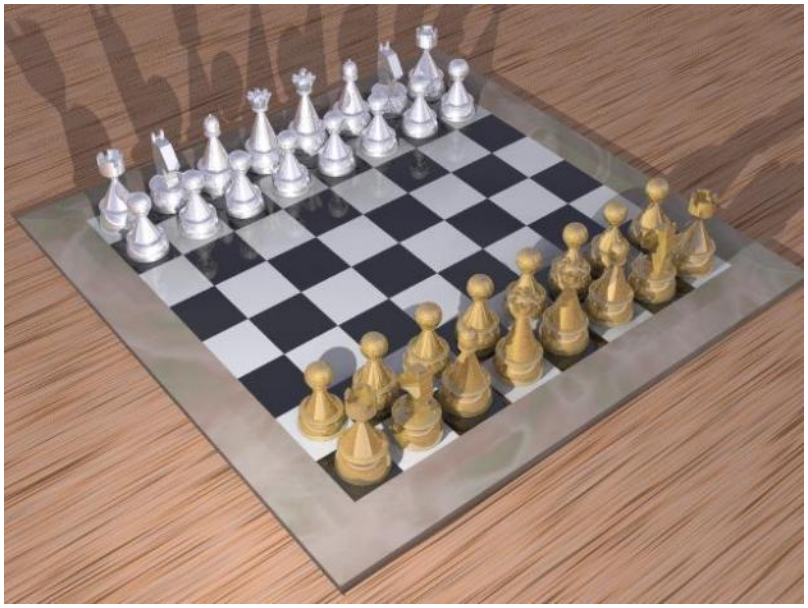
- Japanese Gaming at Midway [Perla and Caffrey]
- Japanese Gaming after Guadalcanal [Perla]
- Admiral Chester Nimitz and wargaming [Caffrey]
- Desert Crossing (June 1999) [AAR]
- U.S. Tested Afghan Options in Secret War Game [Article]
- Dempsey (UQ)

Ancient Games for Educating Military Leaders

- **Sun Tzu credited with development of first application of game in a military context (Similar to the Japanese game of *Go)***



Chaturaji (India)



Chess

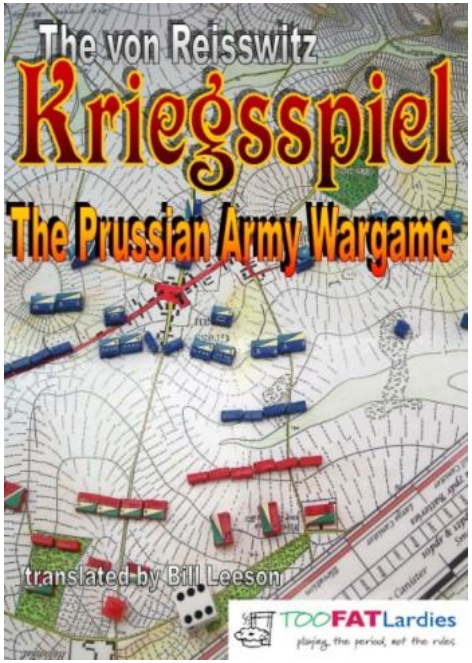
Many countries understood how games could be used to teach their military leaders to be better decision-makers.

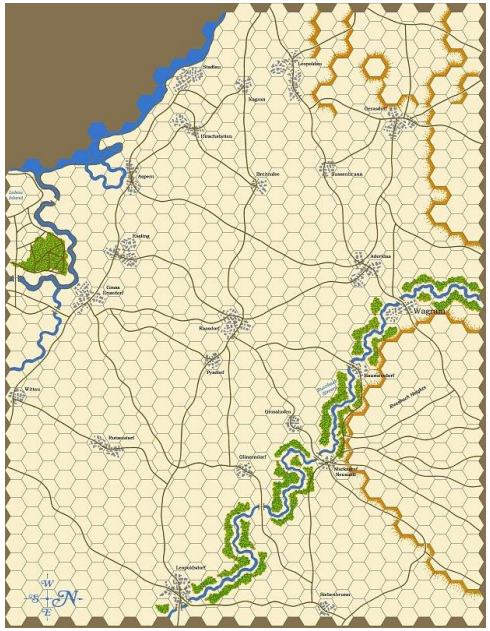
Vogue of Military Mathematics

- Mid 18th Century Prussians advance idea that warfare is an exact science
- Places war as a branch of applied mathematics resembling geometry
  - Rigid formations
  - Military tactics highly structured
- A military leader must be a great calculator
  - War resembles a game played according to specific rules.
  - The "science" of war becomes part of curriculum in academic institutions and military schools.

This eventually evolves into the physics-based computer modeling used by many militaries in the 20th Century.

Kriegsspiel





- **Rigid Kriegsspiel—many rules, slow play**
  - **Forerunner of mathematics-based computer models.**
- **Free Kriegsspiel –almost no rules, war-experienced Prussian officers judge younger officers' plans and actions**
  - **Forerunner of wargaming, focused on human players planning and making decisions.**

What is wargaming used for?

- Problem clarification
  - Understanding the problem
  - Scoping the problem
- Explore new concepts
  - New US nuclear weapons policy
  - How to employ new weapons systems (e.g., LCS, unmanned vehicles, electro-magnetic guns)
- Better understanding of the impact of decisions
  - Increasing troop strength in OEF by 44K
  - What happens to Iraq if you take out Saddam Hussein?
  - Response to probable world events
- Course of Action analysis (MDMP, warplans, training commands and staffs)
- Front end analysis before closed form combat modeling
  - New weapons system employment
  - Tactics, techniques, procedures, operational art
- Analysis (by exception)
  - Severe time constraints
  - No other tools available

Pearl Harbor 1932
(Fleming, American Heritage, Jul/Aug 2001)

- ADM Yarnell, as part of Grand Joint Army Navy Exercises, conducts a successful attack on Pearl Harbor.
- Attack was planned, but most senior leaders believed the attacking carrier fleet would be discovered and sunk long before it could get close enough to launch an air attack.
- Attack was unopposed, defense caught napping.
- Yarnell and a few other 'airpower advocate' admirals argued it was a stunning victory, and Naval tactics should be re-examined.
- Battleship admirals voted them down, air attack against Oahu assessed "doubtful" in final report.
- Japanese observers forwarded a report of Yarnell's exploits to Tokyo.

- **In 1936, Japan's NWC circulates a monograph. Contained within: "in case the enemy's fleet is based at Pearl Harbor, the idea should be to open hostilities by surprise attack from the air."**
- **Between 1936 and 1940, the US Navy laid keels for 12 battleships and only one aircraft carrier.***

**** CAPT Wayne Hughes, USN (Ret): From "Ships and Aircraft of the US Fleet" from 1936 to 1940: 8 battleships and 2 carriers; however 1941: 2 battleships and 9 carriers.***

The Battle of Midway and wargaming
(Perla, pp. 46-47)

- RADM Ugaki, presiding officer at Japanese HQ Combined Fleet, frequently intervened to set aside rulings by the umpires:
  - Two carriers, Akagi and Kaga, were “unsunk” after Midway wargame by Ugaki overruling umpires.
  - Ugaki counsels about possibility of enemy carrier task force appearing on flank (exactly what happened).
- Ugaki also correct about downgrading B-17 effectiveness attacking ships.

Was Ugaki to blame for the Japanese failure at Midway? Were the games a failure (or was it failing to learn from the games)?

Without knowing the purpose of a game, it is foolish to judge if the game was a success!

Japanese Gaming after Guadalcanal
(Perla, p. 48)

- General Staff seeks the best Red (US) players for the game.
- Found Japanese Naval Intelligence Officers that had been assigned to the Japanese Embassy in Washington and interred when the war broke out.
- In August 1942, in an agreed-upon exchange, the navy officers were released for repatriation to Japan.
- The General Staff had the officers met before their ship docked in Tokyo, and had them taken to Naval HQ and held incommunicado so as to keep their knowledge of the US pristine.
- Resulting game demonstrated that the Japanese would eventually be overwhelmed by the greater US resources, once they were focused on the war effort.

Wargaming cannot be done properly without an opponent that accurately represents the actual opponent. The best-designed wargame will be an abject failure without the proper players!

US Wargaming in World War II

- **US Navy wargames "Plan Orange" (war against Japan) at the US Naval War College for many years between WWI and WWII**
- **US Navy Admiral Chester Nimitz: Wargaming was so thorough that "…nothing that happened during the war was a surprise - absolutely nothing except the Kamikaze…"**

US and Soviets
1945-1989

- As the Cold War enters the 1960s, the rise of computer models focuses both countries on physics-based (mathematical) calculations of combat.
- Closed-form combat models:
  - Reduce human decision making to ratios (attack at 3:1).
  - Help fuel the US-Soviet conventional force arms race.
  - Were used as part of the decision process to spend billions of US dollars on new weapons (M1 tank, AH-64 Apache helicopter, MLRS rocket launcher,…)

- Human-in-the-loop combat models combine elements of wargaming and closed form combat models. Used primarily for training commanders and staffs.

Closed-form: the model runs without human intervention for the entire period of combat. Human-in-the-loop: Humans are interacting with the computer model, making decisions on the employment and engagement of forces.

U.S. Tested Afghan Options in Secret War Game
[extract]

FOXNews.com Monday October 26, 2009

The top Pentagon military officer conducted a secret war game this month to evaluate the two primary troop deployment options being considered by the Obama administration in a broad review of the war in Afghanistan, Fox News confirmed Monday.

Joint Chiefs of Staff Chairman Adm. Mike Mullen led the exercises to examine the outcome of two possible scenarios: The first requires sending 44,000 more troops into the country to conduct a full-scale counterinsurgency effort -- aimed at building a stable Afghan government that can control most of the country. The second calls for inserting far fewer soldiers and Marines than Gen. Stanley McChrystal has sought -- 10,000 to 15,000 -- as part of an approach that the military reportedly has dubbed "counterterrorism plus.“

"War games are designed to test the judgment and the ability of a leader to make decisions under pressure," said Lt. Col. Anthony Shaffer, a senior fellow at the Center for Advanced Defense Studies in Washington, D.C., noting that such games require the military to have a clear understanding of the Taliban, which he described as "unpredictable."
"I don't think we have a clear understanding of our adversary," said Shaffer, who wasn't involved in the exercise. "I would caution anyone to use the outcome as any real bellwether of what [is] likely to happen.”

The Pentagon war game did not formally endorse a direction. Instead, it tried to gauge how Taliban fighters, Afghan and Pakistani governments and NATO allies might react to either of the scenarios.

Mullen has discussed the exercise's conclusions with senior White House officials who are involved with shaping the new strategy.

One of the exercise's key assumptions was that an increase of 10,000 to 15,000 troops would not give U.S. commanders the forces they need to take back havens from the Taliban in southern and western Afghanistan.

Desert Crossing (June 1999)*

- Sponsored by GEN Anthony Zinni, CinC CENTCOM
- Wargame designed to focus on Phase 4 of the (current) Iraq war plan.
- Issues included: Security, Reconstruction, Humanitarian aid, Economic development, and Political stability.
- Results:
  - Planning: The US cannot afford to wait until after the intervention begins to orchestrate interagency coordination and planning.
  - Military Action: It should be "swift, large-scale, and decisive," not only to overwhelm any remnants of Saddam's military but to demonstrate a show of force to minimize violence and ensure security.
  - Political Stability: Regime change may not enhance it; in fact, Iraq's neighbors may try to take advantage, particularly if there is internal fragmentation.

  - **Leadership in Iraq: It is crucial to identify potential Iraqi leaders well in advance of regime change, if possible.**
  - **Exit Strategy: The preferred "end state" for Iraq was a unified country with self-reliant political and economic systems, a stable security environment free from internal and external threats, respect for human rights and decent treatment of its own people, and recognition of its international borders and obligations.**

"When it looked like we were going in, I called back down to CENTCOM and said, 'You need to dust off Desert Crossing.' They said, 'What's that? Never heard of it."- General Anthony Zinni, USMC (ret.), 2004**

** Herman, Frost, Kurz, "Wargaming for Leaders," McGraw-Hill, 2009.*

***http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB207/*

GEN Dempsey: What Does the Army Do Next?

- Professional development point for analysts: Getting the definitions right—words matter. [Too often, warfighters create and then toss about terms that sound neat, but mean something different to everyone who uses them (irregular warfare, domain awareness, information dominance, influence operations, …)
- On wargaming for Force Structure questions: “The wargame’s goal is to find the right questions the Army needs to be asking, not arrive at the answers…” [problem definition!!!]

Other Gems from Caffrey

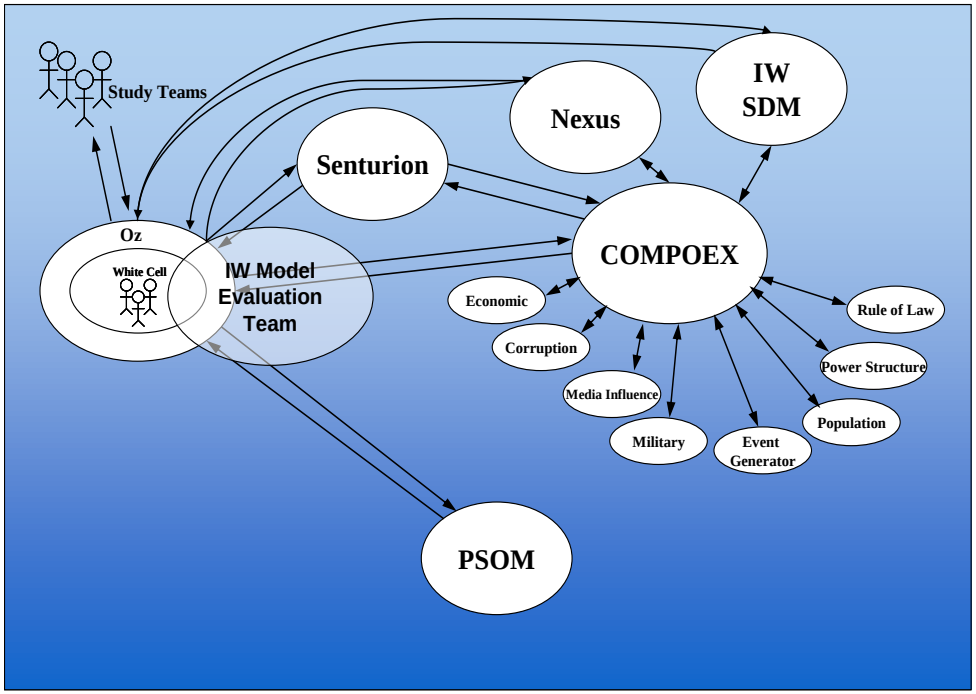
- Jane's All the World's Fighting Ships starts in early 1900s as a (commercial) wargaming reference!
- Capt George Kenney, USAAC, develops air/land/sea wargame in 1929. (Later, Kenney became GEN MacArthur's air commander. The book "General Kenney reports" is one of my favorite "WWII OR books" that never mentions the words "Operations Research" together, very entertaining and imaginative).
- US Navy refines early WWII estimates by examing "logistical constraints."
- Navy aviation community uses wargames to explore operational concepts and ship design.
- US Army Gen George Marshall conducts Louisiana Maneuvers.
  - Bad data (overestimate of tank-destroyer capability from the PM!) provides bad results.
  - Ground officers vs airpower—game rigged.
- Politics cannot be discounted—war is not just about combat.

Recent/Ongoing Irregular Warfare (IW) Modeling

- Africa Analytic Baseline (US Office of the Secretary of Defense)
- IW System Dynamics Model (US Joint Staff (J-8))
- TRAC (Training and Doctrine Command Analysis Center) IW Capability (US Army)
  - IW Tactical Wargame
  - Cultural Geography
- UrbanSim (US)
- Peace Support Operations Model (UK Dstl)

Africa Analytic Baseline
(US Office of the Secretary of Defense: 2007-2008)

- **Purpose**
  - To develop an ***Irregular Warfare*** (counterinsurgency (COIN), counter-terrorism (CT), building security capacity (BSC)) ***Analytic Baseline*** (scenario, concept of operations, and integrated data) to support future DoD assessments
  - To improve *interagency* Irregular Warfare (IW) *analysis* & collaboration
- **Objectives**
  - Provide insights on the *effectiveness of allocated forces* and their employment
  - Perform *mobility/logistics/sustainment analysis* for large military and interagency deployment to *Africa*
  - Advance Irregular Warfare *modeling and simulation*
  - Better define *data requirements* for IW analysis



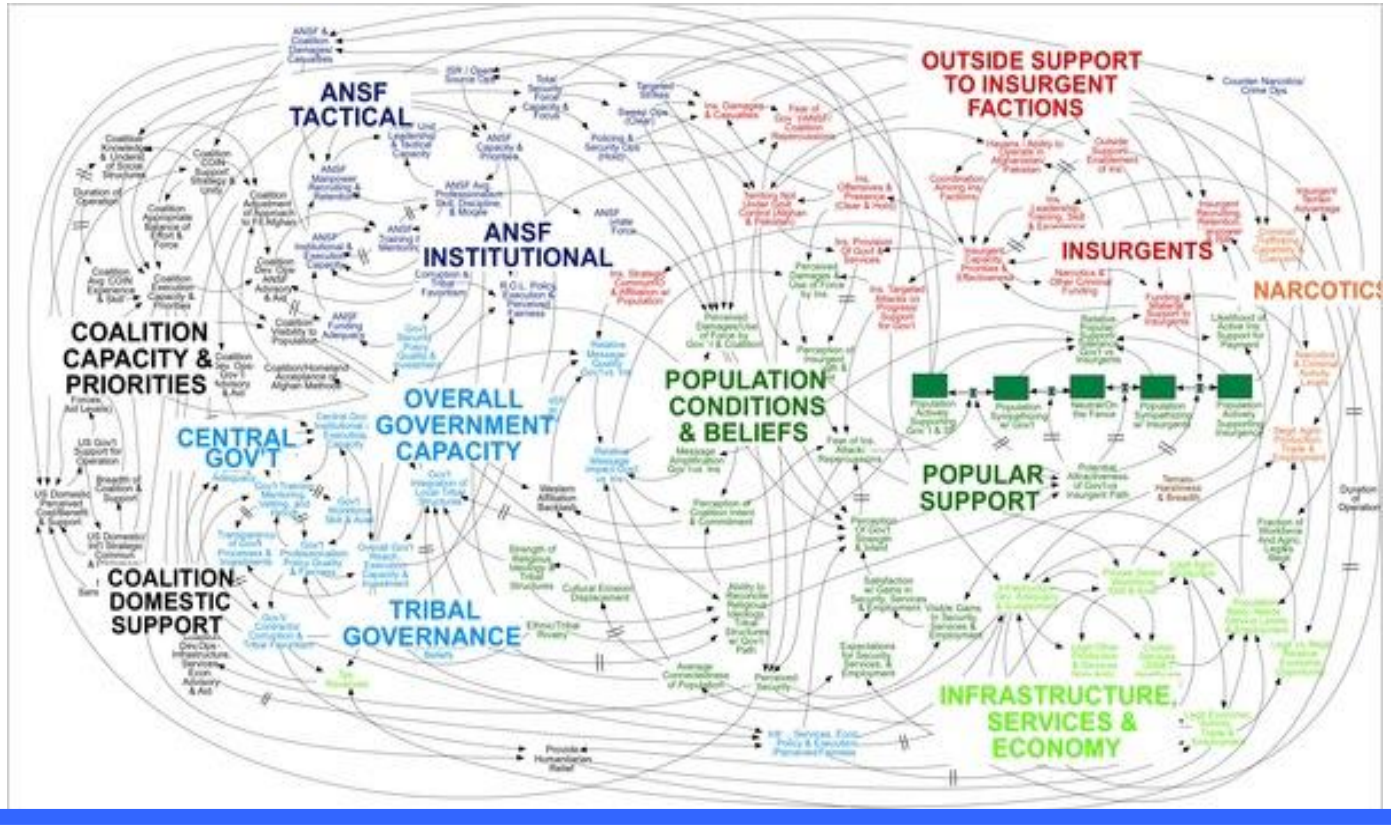
OSD-CAPE SAC initiated/joined these modeling and simulation projects:

- Irregular Warfare System Dynamics Model
- Nexus Intelligent Agent Models
- Peace Support Operations Model
- Senturion
- COMPOEX
- Oz Wargame Integration Toolkit

Used many different models of IW to represent an African scenario to better understand those models' capabilities.

Irregular Warfare System Dynamics Model (IWSDM) (J-8 WAD 2007)

- **The IWSDM Model was developed as an initial pilot simulation – "broad but shallow" – to aid wargaming of a specific scenario**
  - **Quantitative model development: 10 wks duration, completed in early Dec 07**
  - **Built on FM 3-24 model developed with J8/WAD (PA Consulting)**
  - **Expanded by OSD-CAPE SAC for the Africa Study**



Used a technique called "systems dynamics" to model the complexity of counterinsurgency. This diagram represents Afghanistan.

IW Tactical Wargame

Human-in-the-loop tactical level wargame that simulates the commander's operational plan along his LOEs, the execution of that plan, and the results of those actions.

Planning:

- **Represents relevant actors that impact the COIN environment which includes Coalition Forces, Host Nation Security, Threat, and the civilian population.**
- **Players discuss and plan their weekly, Platoon-level tasks by considering guidance from leadership, their LOEs, resources, and information from the previous game turn(s).**

Adjudication:

- **Determines if and when interactions between Coalition Force and Threat occur.**
- **Calculates the results from actors' actions through a stochastic process to include actions that impact the elements of the operational environment.**

Visualization Environment:

- **Results from the tactical tasks are synthesized to provide the players with situational awareness of the Area of Operations (AO) from the previous week(s)' selections.**

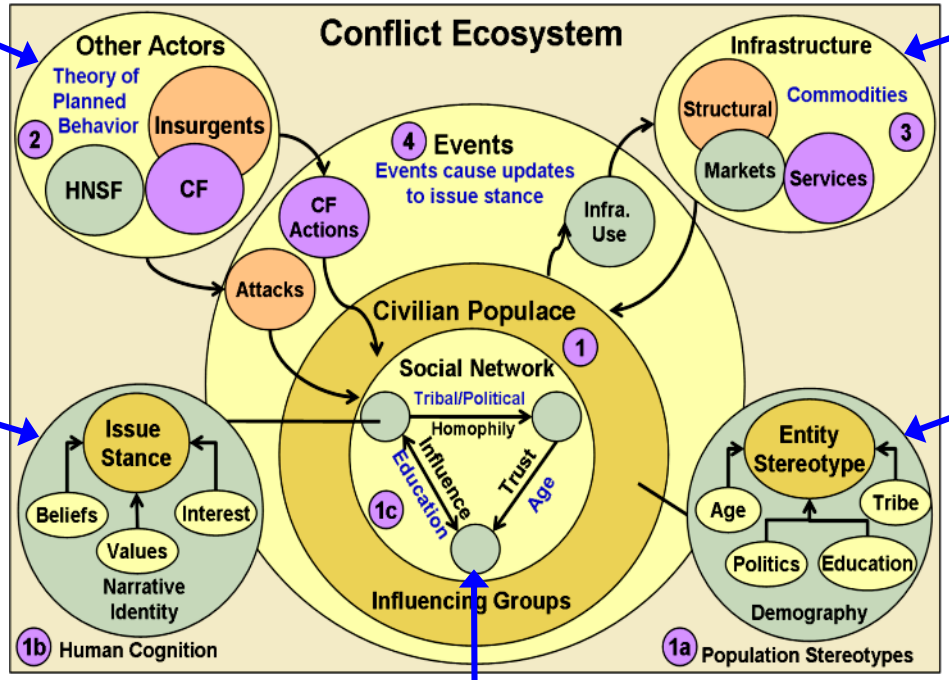
PAVE (Planning, Adjudication, and Visualization Environment): GUI used by the players to adjudicate and record the Tactical Wargame.

A wargame that focuses on tactical commanders' actions in an Irregular Warfare environment. Has been used to model both Iraq and Afghanistan.

Cultural Geography (CG) Model

The CG model is an agent-based simulation of the operational environment based on doctrine and social theory focusing on the population's evolving stance on issues and related behaviors.

Coalition, host nation security forces, and adversary actions can be provided by human-in-the-loop wargaming or closed form simulation.



Each Infrastructure object represents a provider of goods and service and is modeled by a multi-server queue.

Each entity's issue stance is based on its interests, values, and beliefs derived from their narrative identity.

The population in the area of operations is segmented by socio-demographic, socio-cultural and socio-economic factors and entities are drawn from each population segment.

The social network represents relationships and influence. Entities and organizations propagate Information on events through the social network. Persuasion and influence depends on qualitative social science theories.

A model focused on the civilian population. Used in the TRAC Tactical IW Wargame.

UrbanSim (ICT, USC)

THE MILITARY JANUARY/FEBRUARY 2010 ATLANTIC

A new computer game lets army officers practice counterinsurgency off the battlefield.

by *Brian Mockenhaupt*

SimCity Baghdad

UrbanSim is a PC-based virtual training application for practicing the art of battle command in complex counterinsurgency and stability operations.

The UrbanSim practice environment allows trainees to take on the role of an Army battalion commander, and to plan and execute operations in the context of a difficult fictional training scenario. Trainees direct the actions of a battalion as they attempt to maintain stability, fight insurgency, reconstruct the civil infrastructure, and prepare for transition.

An innovative aspect of UrbanSim will be the deep social simulation built into the training applications including models of population and culture groups (tribes, religious groups, criminal gangs, neighborhoods...), key individuals, social networks, and links between the human terrain and the physical terrain.

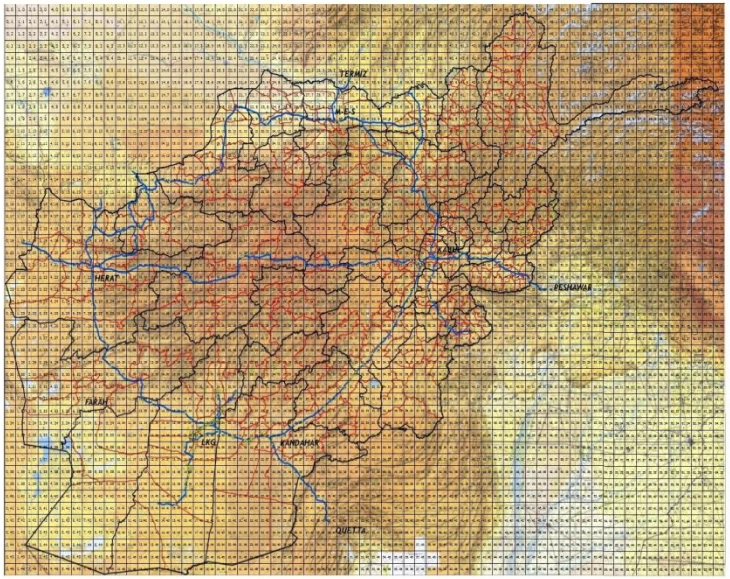
Used to educate US Army officers selected for battalion command

PSOM
Background

- **The PSOM was generated by a need to understand stabilization and COIN – the prevailing concerns emerging from UK involvement in Iraq and later Afghanistan. It was established that PSOM would represent:**
  - **Peace Enforcement,**
  - **Peacekeeping**
  - **Stabilization**
  - **COIN**
  - **elements of Counter Terrorism.**
- **The US doctrine called 'Irregular Warfare' covers all these activities and more clearly defined the relationship between COIN, CT, Stabilization and PSO.**
- **The challenge for the PSOM developers was to ensure that the UK and US approaches (subtly different in places) were both capable of being represented in PSOM.**

Peace Support Operations Model (PSOM)

- **Support for ISAF**
  - **In March 2011, a team of analysts from UK MOD deployed briefly to HQ ISAF Joint Command to help HQ IJC test their Operational Plan, OP OMID 1390, using the Peace Support Operations Model**
  - **A second exercise was a joint UK / US exercise, and took place in November 2011.**
- **US Partnership for Peace Training and Education Center (USPTC) developed a two-week United Nations Peacekeeping Operations Training Course:**
  - **Week one provides an introduction to UN PKO, primarily through lectures tailored for individual students.**
  - **Week two provides a means to assess, reinforce, and complement week one training, primarily through an interactive PSOM classroom "Game for Peace" exercise tailored for student groups.**
  - **Week 2 courses conducted in both Kyrgyzstan and Kazakhstan in fall of 2011.**



The Caucasus and Central Asia

Questions/comments/concerns?