Wargames and Simulation

Simulation Australasia Sim Café
27 Nov 2020

https://simaust.com/

Outline

- Definitions in context
- Games and simulations
- Learning objectives

Elyssebeth asked me to present a few comments on wargaming. I have tried to put together some thoughts that might be of interest to the 'serious gamers'.

My plan is to provide some definitions of 'wargame' and note the context of that definition. I will then briefly discuss the relationship of wargames to games and simulations and then introduce the use of learning objectives.

Introduction

Todd Mason masont@bigpond.com

Disclaimer: Not speaking for Defence

By way of introduction:

I started working for Defence in 1990 when I joined the Army War Game Centre. At the time Army was transitioning from manual wargames to computer based simulation and we developed software for use in both analytical and training wargaming. I was fortunate enough to be one of the last people to do the old manual "board controller's course" and also participate in the early automation efforts that encompassed computerised calculation, data recording, data analysis, visualisation, networking, distributed simulation, and artificial intelligence.

We introduced computer simulation for combined arms and joint training that led to the creation of the Combat Officer's Advanced Course. In particular I developed models for precision air strike, amphibious and littoral operations, humanitarian operations, and counter-insurgency operations.

At the end of 2009 I moved into other areas of simulation and education, including health and emergency services. In 2014, I began coordinating the Australian arm of the Connections international professional wargaming community. In 2019, I returned to Defence to work at the Australian Defence Simulation and Training Centre (now Joint Collective Training Branch). In 2020 I moved to the Joint Operations and Analysis Division of DSTG where I support wargaming, and other analysis, for experimentation.

I have a bachelor of (workplace) education and (organisational) development, and graduate certificates in computing, project management and program evaluation.

Resurgence

2015 US Deputy Secretary Robert Work wrote a paper encouraging more wargaming to support innovation.

https://warontherocks.com/2019/11/getting-the-story-right-about-wargaming/

https://warontherocks.com/2019/10/the-obstacles-on-the-road-to-better-analytical-wargaming/

https://warontherocks.com/2019/10/rolling-the-iron-dice-from-analytical-wargaming-to-the-cycle-of-research/

https://warontherocks.com/2018/11/building-a-pipeline-of-wargaming-talent-a-two-track-solution/

https://warontherocks.com/2015/12/revitalizing-wargaming-is-necessary-to-be-prepared-for-future-wars/

In recent years, there has been a resurgence in interest in wargaming. In part this is driven by remarks (then) Dep Sec Work made about the need for more wargaming along the lines of that conducted by the US Naval College prior to WW2. There have been a number of articles posted on 'War on the Rocks' about wargaing.

PaxSims is another site with frequent news articles about wargaming.

What is a Wargame?

In the literature and general media, the term 'wargame' is used to cover a variety of activities. This includes field exercises, planning activities, board and computer games. Wargame can have a different meaning depending on the context.

Wargames, Models, Simulation...

"many in the military are simply uncomfortable with the term 'wargame', perhaps feeling that war is too serious for 'games'... many different terms have been used in lieu of 'wargame'. These include; Map Maneuver [sic], Chart Maneuver [sic], Field Maneuver [sic], Exercise, or increasingly, 'modeling [sic] and simulation.'"

Caffrey, Matthew. 2000. Toward a History Based Doctrine for Wargaming. Aerospace Power Journal. Fall 2000.
https://apps.dtic.mil/dtic/tr/fulltext/u2/a521381.pdf

"these terms have multiple and contradictory meanings in common English. For example, "models" include a ship in a bottle, theories of expansion of the universe, and political scientists' conceptual frameworks. "Simulations" include the playing through of procedures by a team of workers, various types of models and computer programs, and electric-train networks enjoyed by hobbyists. There are some relatively general definitions, but none of them can encompass all the usages, because usages are contradictory."

RAND 1991. The Base of Sand Problem. A White Paper on the State of Military Combat Modeling
https://www.rand.org/pubs/notes/N3148.html

The vagueness of the term wargame and related terms has been noted in a number of sources.

Matt Caffrey notes that the military tend not to like the 'game' part of the word and this can make research difficult.

RAND note the multiple uses of related words. This suggests the need to be clear about how words are being used in a particular context.

Dictionary Definition

OED: "wargame" or "war game" is a translation of the German term *Kriegspiel*. It is "used of any game simulating war especially an elaborate game played with model soldiers, or of any exercise by which a military strategy is examined or tested."

Kriegspiel is defined as "a game in which blocks representing parts of armies, guns etc., are moved about on maps. Introduced into the English Army after the Franco-German war of 1870."

The earliest citation for kriegspiel dates from 1811: "In Switzerland a game has lately been made of war (*Das Kriegspiel*), which is played with figures upon a map, and is exceedingly instructive to military students, because the principles upon which it is constructed are applicable to real operations in the field."

There is no citation for wargame.

The OED asserts that the term is a direct translation of the German term *kriegsspiel*. As such, it fundamentally means nothing more than a game about war.

German Wargames

1616 Duke August II of Brauenschweig-Wolfenbuettel *Das Schackoder Koenig-Spiel* (Chess Game or Kings Game)

1644 Christopher Weikmann *Neu-erfundenes grosses Koenig-Spiel* (Newly Invented Great King's Game)

1780 Dr. Johann Christian Ludwig Helwig *Koenigspiel* (King's Game)

1797 Georg Venturini *(Neue Kriegsspiel* (New War Game)

1811 Georg Leopold von Reisswitz (sr) *Kriegsspiel* (sand table)

1812 Reisswitz (sr) (wooden table)

1824 Georg von Reisswitz (jr) *Kriegsspiel* (topographic maps)

1850+ W. von Tschischwitz, Thilo Wolf von Trotha, and von Neumann "rigid Kriegspiel"

1875 Klemens Wilhelm Jacob von Meckel *Anleitung zum Kriegsspiel* (Instruction to the War Game) "free Kriegsspiel"

1876 Julius von Verdy du Vernois *Beitrag zum Kriegsspiel* (Contribution to the War Game) "free Kriegsspiel"

1900 M. H. Temple Kriegspiel or blind chess.

Dr. Milan Vego 2012, German Wargaming, *Naval War College Review, Autumn 2012, Vol. 65, No. 4*

Smith, Roger 2010. The Long History of Gaming in Military Training. Simulation and Gaming. Vol 41.

Caffrey, Matthew. 2019. On Wargaming. US Naval War College. https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1043&context=newport-papers

Schuurman, Paul. 2017. Models of War 1770-1830: The Birth of Wargames and the Trade-Off between Realism and Simplicity. History of European Ideas, 43:5, 442-455, DOI:10.1080/01916599.2017.1366928

The German tradition of wargames developed over a couple of hundred years from variations of chess. There was a long history of games designed to reflect aspects of war and the 'game' component was an accepted element of the concept.

Defence Simulation Glossary

A wargame is "a **simulation game** in which participants seek to **achieve a specified** military **objective** given pre-established **resources** and **constraints**; for example, a simulation in which participants make battlefield decisions and a computer determines the results of those decisions."

Simulation: "a method for implementing a model over time"

Game:?

Simulation-Game:?

The Defence Simulation glossary states that a wargame is "a simulation game in which participants seek to achieve a specified military objective given pre-established resources and constraints; for example, a simulation in which participants make battlefield decisions and a computer determines the results of those decisions." (IEEE 610.3-1989 – withdrawn 2000).

The glossary does not define 'game' or 'simulation-game' and has a weak definition for 'simulation'.

As an aside, the Defence Simulation Glossary and other Defence publications tend to spell "wargame" as two words - "war game" - but spell the verb "wargaming" as one word. In fact the DSG specifically notes the different grammar. Why this is the case is unclear, but it has a long history and is the subject of considerable debate in the literature. I tend to use the (academically preferred) one work term, and only use two words when directly quoting another source.

ADFP 7.0.3 Exercise Planning and Conduct (2018)

A wargame is "a **simulation** by whatever means of a **military operation** involving two or more forces—opposed or not—using rules, data and procedures designed to depict an actual or assumed real-life situation."

This defines a wargame as: "a simulation by whatever means of a military operation involving two or more forces—opposed or not—using rules, data and procedures designed to depict an actual or assumed real-life situation."

Given the context, it is not surprising that this definition downplays the competitive 'game' aspect and potentially includes field exercises. However, it probably assumes that most 'wargames' use computer simulation.

This definition is a minor alteration from the Army definition from Training Information Bulletin (TIB) 52 (1980) which said:

"A war game is a simulation technique depicting operations involving two or more opposing forces, conducted using rules, data, and procedures designed to represent an actual or assumed military situation."

The TIB definition itself is derived from US and NATO definitions from the 1960s.

These "cold war" definitions sound to me somewhat defensive. I speculate that they are in part an attempt to contrast "proper" wargaming that uses data, models and adjudication, from BOGSAT gaming that has the reputation of relying on opinion, assertion, rhetoric and speculation. They also may be an attempt to group wargaming with other forms of operations research that developed during World War II and were an important tool for military capability development in the post-war era.

ADFP 5.0.1 Joint Military Appreciation Process (2019)

a "war game **simulates**, by whatever means, a **military operation** bringing together two or more actors (opposed or not) to **study the consequences** of their interaction.

The object is to expose flaws in the friendly COA particularly when pitched against adversary COA, so as to refine and improve the friendly COA. The military experience and operational art of commanders and staff are paramount to validate and verify each friendly COA against the adversary's most likely and most dangerous COA, or any **non-adversarial threat scenarios**."

https://nara.getarchive.net/media/photograph-of-japanese-wasing-in-pool-with-mockup-of-ford-island-and-battleship-c37582

Figure 5.1: Action, action and review sequence

f. select war game method:

(1) time-event

(2) avenue in depth

(3) time box

(4) belt.

A "war game simulates, by whatever means, a military operation bringing together two or more actors (opposed or not) to study the consequences of their interaction. The object is to expose flaws in the friendly COA particularly when pitched against adversary COA, so as to refine and improve the friendly COA. The military experience and operational art of commanders and staff are paramount to validate and verify each friendly COA against the adversary's most likely and most dangerous COA, or any non-adversarial threat scenarios."

This definition focuses on the player interaction and the consequences of decisions. The intent is to subject a plan to enemy contestation.

GUIDEx: ABCA Guide for Understanding and Implementing Defense Experimentation (2006)

A wargame is "A **synthesis of warfare** with a defined ruleset, involving the multi-sided and **adversarial engagement of human players**."
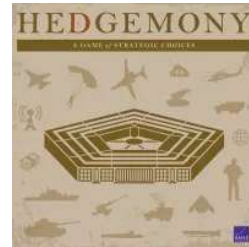
https://www.cna.org/news/InDepth/article?ID=19

Understanding Russian Black Sea Power Dynamics Through National Security Gaming

https://www.rand.org/pubs/research_reports/RR3094.html

HEDGEMONY

https://www.rand.org/pubs/tools/TL301.html

The most frequently cited source for analytical wargaming comes from GUIDEx. This was developed with input from all ABCA nations including Australia (DSTO). "A synthesis of warfare with a defined ruleset, involving the multi-sided and adversarial engagement of human players."

"Wargames may or may not use an experimental approach as described in GUIDEx. The possible range of underlying computer simulation support is: i. none (i.e., seminar or tabletop wargames); ii. an Analytic Wargame (i.e., turn-based adjudication); or iii. a HITL simulation (e.g., Janus or JSAF) (i.e., continuous human interaction). iv. Human interaction with wargames is usually, but not necessarily, abstract, in that the real organizational structures and manning levels are not accurately represented. For example, two or three officers may represent an entire headquarters."

"Most defense experiments use some form of simulation, which can be grouped into one of four general methods: constructive simulation, analytic wargames, human-in the-loop simulation, and live (field) simulation."

GUIDEx identifies four general methods of simulation used for experimentation: constructive simulation, analytic wargames, human-in the-loop simulation, and live (field) simulation. Analytic wargames are elaborated as follows:

"Analytic wargames typically employ command and staff officers to plan and execute a military operation. At certain decision points, the Blue players give their course of action to a neutral, White cell, which then allows the Red players to plan a counter move, and so on. The White cell adjudicates each move, using a simulation to help determine the outcome. A typical analytic wargame might involve fighting the same campaign twice, using different capabilities each time. The strength of such wargames for experimentation resides in the ability to detect any change in the outcome, given major differences in the strategies used. Additionally, to the extent that operational scenarios are used and actual military units are players, analytic wargames may reflect real-world possibilities. A major limitation is the inability to isolate the true cause of change because of the myriad differences found in attempting to play two different campaigns against a similar reactive threat.

A seminar wargame is additionally defined as: "A structured discussion between experts in several fields to elicit opinions and judgments from them, and to increase understanding. It is more structured than brainstorming (or seminars), but is not normally supported by any kind of simulation (like analytic wargames)."

RAND are well known for designing and conducting experimental wargames. DSTG has considerable experience here in Australia.
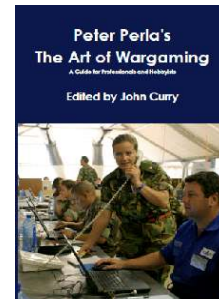
Dr Peter Perla
formerly from the US Centre for Naval Analysis

"A wargame is a **warfare model or simulation** whose operation does **not involve** the activities of **actual military forces**, and whose sequence of events affects and is, in turn, **affected by the decisions** made by the players representing the opposing sides. … In the end, a wargame is an exercise in **human interaction**."

Perla, the Art of Wargaming, p 164

http://www.wargaming.co/professional/details/ppart.htm

Why Wargaming Works. Naval War College Review Vol 64. 2011
https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1578&context=nwc-review

https://boardgamegeek.com/boardgamedesigner/2728/peter-perla

Dr Peter Perla, formerly from the US Centre for Naval Analysis, (https://www.cna.org/), is probably the most well known professional wargamer. He wrote one of the founding books on wargaming. He states that:

"A wargame is a warfare model or simulation whose operation does not involve the activities of actual military forces, and whose sequence of events affects and is, in turn, affected by the decisions made by the players representing the opposing sides. … In the end, a wargame is an exercise in human interaction." (Perla, the Art of Wargaming, p 164)

More succinctly, Perla (KCL lecture 2018) says "people have to make decisions in a competitive environment, and they have to live with the consequences of those decisions in that environment".

Importantly, Perla distinguishes a wargame from an exercise.

Perla – emphasis on players, decisions and opposition.

Martin van Creveld

MARTIN VAN CREVELD

WARGAMES

FROM GLADIATORS TO GIGABYTES
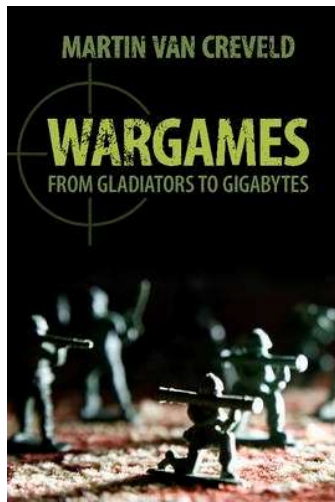
2013

ISBN13 9781107684423

A wargame might be defined as a game of strategy.

The art of seeking to **achieve your objectives** in the face of an **opponent who thinks and acts** ... [in order to] achieve his objectives … [and is trying to] actively prevent you from doing the same. … It is … a question of trying to detect, predict, interfere with, and obstruct … [the moves] of the opponent.

[People] engage in play primarily do so because it gives them some kind of thrill.

A military and cultural historian, he has a much broader definition of wargames and includes gladiatorial combat as a wargame. He sees the strategic characteristic of wargames to be the defining characteristic.

He also notes that games are an integral part of human culture and people enjoy playing games at quite a primitive or visceral level. To be enjoyable, games must be not impossible, but difficult enough for the challenge to be rewarding.

Harold Murray

"The typical [wargame] is one in which two players direct a conflict between two armies of equal strength upon a field of battle, circumscribed in extent and offering no advantage of ground to either army."

H. J. R. Murray, A History of Board Games other than Chess. Oxford University Press 1951 (p53)

Murray categorises board games into:
- Alignment and configuration
- **War-Games**
- Hunt-Games
- Race-Games
- Mancala games

No logistics/ resource management, games of bluff and deception.

David Parlett (Oxford History of Board Games (1 ed) 1999) classifies *tafl* games as race games due to their asymmetry.

Wargames are then divided into:
- **Battle-games** in which players endeavour to capture or immobilise all there opponent's men.
- **Struggles for territory** in which each player endeavours to obtain control of the larger portion of the board
- **Blockade games** in which no captures can be made and the players endeavour to immobilise their opponent's men
- **Clearance games** in which the only moves are captures and each player endeavours to make the larger number/ value of captures

He wrote a "History of Chess" in 1913 and published "a History of Board Games Other than Chess" in 1951. His work focused on the history of board games used for entertainment. However 'wargames' have particularly strategic objectives.

He does not seem to include resource management or bluff and deception as integral to wargames.

A later Oxford book on games lists *Tafl* games (related to Chess) as 'race' games rather than wargames.

Games

Toy soldiers became popular during the 19th century concurrent with the rise of military wargaming. A number of rules were published as articles, but the first book on the subject was written by H. G. Wells (of science fiction fame) in 1913 – Little Wars.
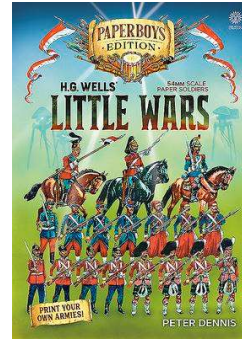
A number of famous people have been miniature wargamers including the actor Peter Cushing (AKA Grand Moff Tarkin from Star Wars).

Little Wars

ISBN13   9781913336004

https://ozkriegspiel.blogspot.com/2013/12/little-wars_9.html

To celebrate the 100th anniversary of little wars, we held a game in 2013.

Traditional Military Purposes

- **Training & Education**
  - Procedural training
  - Decision training
  - Mission rehearsal
  - Preparedness
  - Professional Military Education

- **Course of Action (COA) Analysis**
  - Operational
  - Strategic

- **Research**
  - Capability development
  - Doctrine development
  - Force structure development
  - Equipment evaluation
  - Concept development

War

The other element of the term 'wargame' is the 'war' part. In the modern world this can include conventional joint and combined arms warfare, but also includes humanitarian operations, space and cyber war and increasingly other conflict situations such as business and economics.

The techniques of wargaming can be applied to a number of areas of conflict. Similarly, military operations cover a wide variety of tasks, many of which are suitable for simulations and games. Where the line between 'war' and other activities and 'wargame' needs to be drawn is not clear.

In the same way that the scope can be broad, wargaming can occur at many levels. Wargames exist at the individual, small team, sub-unit, unit, formation and beyond. They also exist at the strategic, political, international and, at least conceptually, the inter-planetary.

Individual, Small Unit, Sub-Unit, Unit, Formation, Operational, Political, Whole of Government, Whole of Nation

"In one moment in time, our service members will be feeding and clothing displaced refugees, providing *humanitarian* assistance. In the next moment, they will be holding two warring tribes apart -- conducting *peacekeeping* operations -- and, finally, they will be fighting a highly lethal mid-intensity *battle* -- all on the same day ... all within three city blocks. It will be what we call the 'three block war'." 1997 Gen Charles Krulak

http://walterdorn.net/pdf/ThreeBlockWar-3BW_Dorn_Optimized-ReducedSize_3Dec2007.pdf

business - alfred bausrath venture simulation in war, busines and politics 1971

clark abt, 1970 serious games

wargaming for leaders mark herman et al, 2009

http://www.cfr.org/united-states/beyond-3-block-war/p10204

http://milnewstbay.pbworks.com/f/future+warfare+hybrid+warriors.pdf

http://www.au.af.mil/au/awc/awcgate/usmc/strategic_corporal.htm

Key Points

- Warfare simulation

- Rules

- Players

- Adversarial

- Decisions

Game?

May or may not involve actual military forces?

Definitions depend on context

Wargames are generally understood to be some sort of simulation of warfare, relying on players and an adversarial scenario. They focus on decision making and strategic thinking. Not everyone considers them games and they may or may not involve actual military forces.

Interactive Learning Activities
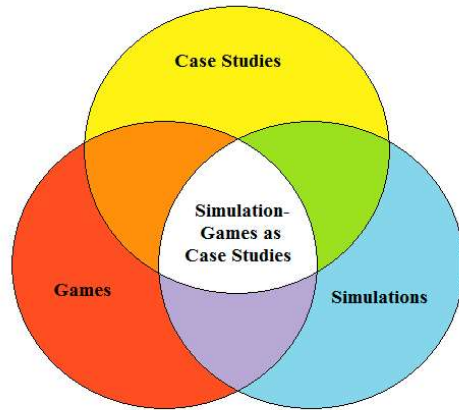
Henry Ellington, Eric Addinall and Fred Percival provide a framework for describing simulation-games and other interactive activities in their book "A Handbook of Game Design" (1982)

My own context comes from my background in simulation for education.

Henry Ellington, Eric Addinall and Fred Percival provide a framework for describing simulation-games and other interactive activities in their book "A Handbook of Game Design" (1982). They define a games as:

"any contest (play) among adversaries (players) operating under constraints (rules) for an objective (winning, victory or payoff)."

This definition is elaborated by a few additional comments:

"it must involve overt competition of some sort, either directly between [players] … or between [players] … competing against the game system … the players must operate under a set of arbitrary constraints specific to the particular game."

Ellington et al define a simulation as "an operating representation of central features of reality" and a simulation-game as "[having] the basic characteristics of both games and simulations". That is, a simulation game is an operating representation of reality that includes interaction and competition between players and/ or the system. In fact, Ellington et al introduce a third category of learning activity – case studies, defined as "an in-depth examination of a real-life or simulated situation carried out in order to illustrate special and/ or general characteristics." They then propose seven categories of learning activity, namely the three primary categories of simulation, game and case study and the four hybrid combinations of them. They illustrate this model using a Venn Diagram.

This is important for the discussion of wargaming because their hybrid category of "a simulation game used as a case study" incorporates the reflection, analysis, debrief and after action review that are a crucial component of any professional wargame. They note that this category includes "all the various simulation games that have been designed for use in specific teaching or training situations … [and those] developed as research tools by military, academic, industrial, commercial, social, government and international organizations". When discussing wargames, it is important to keep all three elements in mind.

At this point, it is worth introducing the term 'serious game'. This is not quiet the buzz phrase now as it was in the first decade of the 2000s, but it is still frequently encountered. Wargaming is often cited as the exemplar serious game, dealing as it does with the very serious matter of war, conflict, casualties and destruction. The term was coined in the 1960s by Clark Abt (1970) who defines it as games with "an explicit and carefully thought out educational purpose, not intended to be played primarily for amusement." However, serious games are not purely for education either, except in the broadest sense of the word. I prefer the term "insight".

Simulation, Game, Case Study

Simulation: "an operating representation of central features of reality"

Game: "any contest (play) among adversaries (players) operating under constraints (rules) for an objective (winning, victory or payoff)"

Case study: "an in-depth examination of a real-life or simulated situation carried out in order to illustrate special and/ or general characteristics."

Wargames typically have all three characteristics.

My Definition

A wargame is "a simulation-game used to gain insight into a (quasi) military scenario."

Taking that context into account, I tend to use this definition, or something similar.

This is not intended to be 'the' definition, just one that works for me.

Insight?

Learning Objectives

Psychomotor	Cognitive	Affective
Imitate	Remember	Receive
Manipulate	Understand	Respond
Refine	Apply	Value
Coordinate	Analyse	Organise
Naturalise	Evaluate	Characterise
	Create	

1. Wargames can combine all three domains.

2. Applies to individuals and teams.

3. Guided learning.

What do I mean by insight?

Basically 'learning objectives'. I believe most, if not all, applications of wargaming can be described by learning objectives. If a wargame is to be qualified, such as analytical or educational, then framing that qualification in terms of learning objectives makes the intent clear.

Wargames allow all three learning domains to be employed at once.

Team based activities, such as leadership and communication training, can consider the team as an entity and apply objectives from the psychomotor skills domain.

See also http://www.kriegspiel.com.au/papers/paper01.pdf

Resources

Connections

    Australia https://connectionsoz.wordpress.com/

    USA http://connections-wargaming.com/

    UK http://www.professionalwargaming.co.uk/
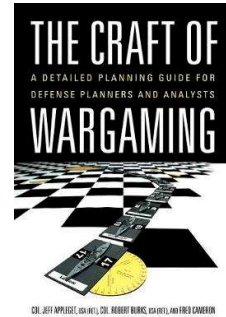
UK Wargaming Handbook
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attach
ment_data/file/641040/doctrine_uk_wargaming_handbook.pdf

PaxSims https://paxsims.wordpress.com/

History of Wargaming Project http://www.wargaming.co/

https://boardgamegeek.com/

THE CRAFT OF
A DETAILED PLANNING GUIDE FOR
DEFENSE PLANNERS AND ANALYSTS
WARGAMING

COL JEFF APPLEGET, USA (RET), COL ROBERT BURKS, USA (RET), AND FRED CAMERON

ISBN13   9781682473764

There are many resources available to further explore wragmaing.

The 'Connections' professional wargaming network is a collection of wargamers from around the globe who hold annual conferences.

The UK MOD published a handbook on wargaming. As has the US Navy and Army.

PaxSims is the best site to keep up to date on professional wargame news and the 'history of wargaming project' has published many historical works on professional wargaming including a second edition of Peter Perla's book.

Boargame geek is the best reference for anything board game related including wargames.

The most recent book to be published on professional wargaming is by the team at the US Naval Postgraduate School. They have been teaching wargaming for many years and gave distilled what they know into a text book style reference.

Questions

Discussion