

WARGAMING – LOOKING AT FUTURE PROSPECTS

Captain Susheel Menon

“A wargame is a story that can change your world. A wargame is a story that can shape your future. A wargame is a story to be experienced, not simply told.”¹

Introduction

In its simplest definition, wargaming can be considered as scenario-based planning where a set of ‘actors’ initiate processes to achieve individual goals and objectives. These actors interface using creative processes that introduce variables and responses in the process. The wargame attempts to create an environment that mimics ‘real life’ and hence attempts to portray a sequence of actions that are likely to occur. The wargame attempts to enable the actors to maximise value while reducing risk and complexity. Simply put, the wargame enables thinkers, planners and executors to validate their strategy while preparing for a crisis.

Wargaming is today a standard tool in the quiver of a planner, be it at the strategic level or the tactical level. It is common today to hear support for a particular course of action with the emphasis that it has been “Proved in a wargame.” Considering the fact that all levels of planning now consider wargaming as an essential route for validation, wargaming techniques have been applied to a wide spectrum of topics. Wargaming has existed in one form or the other through the ages and has been of much use to a warfighter. However, as with all things, there are supporters of wargaming who tend to treat it as a panacea for all strategic to tactical processes and then there are opponents who have expressed lack of faith in the involved processes and undervalued its capabilities.

¹Mark Frost, Robb Kurz, and Mark Herma, “Wargaming: Experience the Future,” *Booz Allen Hamilton: Foreign Affairs*, October (2012): 86,

While wargaming provides a tool and canvas to the planner, there remain many objectives it cannot meet. An understanding of these limitations is important in order to achieve a balanced perspective of wargaming.²

- Wargaming is not analysis in the usual sense of rigorous, quantitative dissection of a problem.
- Wargaming is not real, despite the similarities of gaming language and the gaming experience to many aspects of actual operations.
- A wargame is not duplicable; you cannot refight a game changing only the "random numbers."
- A wargame is an exercise in human interaction, and the interplay of human decisions and the outcomes of those decisions make it impossible for two games to be the same.

Therefore it would follow from the above that wargames of all types and all levels are most suited as investigative processes rather than providing analytical tools to determine specific outcomes. That is not to say that wargaming processes and results are simplistic and empirical. Wargames can help explore questions of strategy, human decision-making, and war fighting trends. They are of little use in providing rigorous, quantitative measures to objectively prove or disprove technical or tactical theories.³

The Narrative in a Wargame

The true benefit of wargaming would be the ability for a participant to derive elements of power and factors of success (as well as drawbacks) of intended plans. The wargame also enables individual participants to question themselves (and therefore their planning processes) by making them dependent and reliant on a logical and relevant narrative. The wargame, therefore, is expected to generate an undercurrent of less tangible aspects than mere facts or models that affects its participants through a narrative.

²Peter P Perla, and Raymond T Barret, "An Introduction to Wargaming and its Uses," *Center for Naval Analyses, CRM 85-91, no. October (1985)*

³Peter P Perla, and Raymond T Barret, "An Introduction to Wargaming and its Uses," *Center for Naval Analyses, CRM 85-91, no. October (1985)*

But how does narrative fit into the concept of a wargame? Wargames can be construed to be a medium that provides the participants to extend a theoretical framework into a physical world and provide some control on portions of the narratives. This is a luxury that the participant does not have in the 'real world'. The individual players become participants in a hitherto theoretical narrative and not merely proponents. As a result of this interaction between the individual and a narrative, what could emerge is either a "presented narrative," which is what we call the written or given narrative, created by the game's designers; or a "constructed narrative," which is developed through the actions, statements, and decisions of the game's participants. The overall game narrative, as can be easily surmised, comprises both the presented narrative and the constructed narrative.⁴

Simply put, the presented narrative is the domain of the game designer and the constructed narrative is the field of the game player. This concept of a two tier narrative, often present simultaneously, implies that the game players are expected to design and apply a series of options in logical pursuit of a particular stream of choices within the presented narrative. This makes them a part of the presented narrative while generating the ability to branch out into a constructed narrative. This process, which merges the two narratives or at the very least collocates them, creates a synthetic product that is a hybrid of the narratives of the players and the game designers. This interaction of narratives is discrete and unique for each set of players (even with a common presented narrative) and thereby provides the flexibility of outcome in a wargame.

There is however a need for a word of caution. Wargames, no matter what the depth and extent of the narrative, will remain an experience in the temporal realm. In order to derive maximum benefit from a wargame, a number of other tools viz. analyses, exercises, history, real-world experience, have to be brought in as integrators and differentiators. Wargames thus derive their power (for good or for worse) from their nature as constructed narrative; they have a more powerful effect on participants than do other narrative forms, because their participants not only are spectators but must act, engaging parts of their intellect and emotions not accessed during simple storytelling.⁵

⁴Peter P Perla, and ED McGrady, "Why Wargaming Works," *Naval War College Review*, 64,3, no. Summer (2011): 112-129

⁵Peter P Perla, and ED McGrady, "Why Wargaming Works," *Naval War College Review*, 64,3, Summer (2011): 112-129

Game Theory and Wargaming

The focus on narrative and player participation may often divert the essence of a wargame away from its theoretical precepts. This leads to a number of shortfalls in the current genre of wargaming that are commonly available in the military domain.⁶

- **Narrow Operational Spectrum** - Existing models do not portray the full range of military operations such as Operations Other Than War (OOTW) and Information Operations (IO)
- **Low Fidelity Interaction** - Modelling & Simulation (M&S) systems that simulate functions such as transportation, logistics, intelligence, space, and special operations do not interact with desired resolution and fidelity with combat models.
- **Decoupled Strategic Effects** - Existing simulations do not reflect the strategic effects of military operations and require excessive intervention and tedious work arounds to inject effects of strategic attack.
- **Poor Adversarial Automation** - Existing simulations provide task organization and equipment for foreign powers but authentic or effective strategy and tactics depend on manual role-playing
- **Labor Intensive** - Scenario development can take many staff-months of effort and the necessity of human role players to provide creditable performance in training exercises exacerbates the problem.
- **Lagging Visualization** - Military wargames have not kept up with commercial games in terms of their graphics and performance characteristics but remains focused on geographic and physical environment.

Game Theory Fundamentals

In a game we have an enumeration of players, each of whom has available some finite collection of discreet actions. Players must simultaneously choose an

⁶GM Whittaker, "Asymmetric Wargaming: Toward a Game Theoretic Perspective," *The MITRE Corporation, September (2000)*

action from among their respective options at each play of the game. Classical game theory assumes that each player knows every other player's action set as well as his own. This is considered as the layer having complete information. It is also assumed that all players are rational, that is, they choose actions in order to optimize their results. A player's rule for choosing among his possible actions is called a strategy.

A pure strategy continually chooses the same action at every play of the game; a mixed strategy chooses an action according to a probability distribution over all possible actions. A pure strategy is therefore just a special case of the mixed strategy. Game theoretic algorithms generate strategies (prescriptions for option choices) that simultaneously account for all players by finding equilibrium points in the strategy space, that is, points where no player can benefit by changing strategy assuming all other players hold to their equilibrium strategy.

Limitations of Classical Game Theory

The precepts of Game Theory in itself are steeped in mathematics and need to be explained in terms of formulae that involve calculations, scenario building and probability. That being a subject in itself, has been examined by many analysts and academicians. What has emerged is a strain of thought that brings out some limitations of free application of the classical form of Game Theory in wargaming. The essence of Game Theory is the mathematical expression of complete information related to a situation. This assumption of complete information is probably the greatest impediment to the practical application of classical game theory.⁷ The 'real world' is much more characterized situations where players have to deal with incomplete information on either the expected results or available options or both.

Erroneous Conclusions

Notwithstanding the theoretical premise and construct of a wargame, there continue to be intangibles in the creation, progress and analysis of a wargame. While war games help people learn how to think, incorrect conclusions and wrong assumptions can be counterproductive to say the least. Regardless of their level of experience, players can succumb to certain pitfalls.⁸

⁷GM Whittaker, "Asymmetric Wargaming: Toward a Game Theoretic Perspective," *The MITRE Corporation, September (2000)*

⁸David B Lee, "War Gaming: Thinking of the Future," *Airpower Journal, Summer (1990)*

- **This Isn't Correct:** Insisting that something about the game isn't right--probably the most common pitfall--reveals more about players than about the game itself. The complaint is especially prevalent when players are not doing well or actually have been defeated. At that point, they typically declare the war game to be in error and lose enthusiasm for continuing. This pitfall stems from their inability to deal with the environment portrayed in the game. Future wars will inevitably be fought differently from their antecedents, and the side that accommodates change will probably win.
- **This Does/Doesn't Prove My Point:** Another pitfall occurs when a war game produces an answer that the sponsor did or did not want. Using a war game to prove one's contention is travesty of how the game should be used. War games are designed to raise issues, not settle them. Furthermore, rejecting the outcome of a game because the result does not fit one's preconceptions invites failure on the battlefield. This was witnessed during the Japanese wargaming of the battle of Midway where losses to the Japanese fleet were predicted by the umpire but were rejected by the planners.
- **The Results Will Show Who Is Going to Win:** Viewing the results of a war game as an infallible indicator of success constitutes the final pitfall. War games, as already noted, are not war and cannot duplicate the chance and often unrelated events of reality. Thus, they should not and cannot be considered predictors. A fine example of this pitfall was the Germans' Schleiffen Plan, which was probably the most gamed plan of its time. Troop movements were painstakingly calculated, train schedules scrupulously kept, and rates of supply and ammunition carefully determined. Unfortunately the game did not take into account the rapid appearance of the French at the front that upset the entire German plan, and resulted in a deadlock.

Future of Wargaming

Theoretical precepts and pitfalls notwithstanding, Wargaming is a tool that is available to the planner which can put together temporal and kinetic aspects of force and therefore provide a near 'real world' environment. This process employs mental faculties thus bringing to the fore the need to prepare, project and

anticipate. In spite of its limitations, it is unlikely that wargaming will be discarded as a tool in the near future.

That being said, wargaming is nothing but a way to determine efficient war fighting as it relates to employment of kinetic and non-kinetic assets. Wargaming does not impinge upon the nature of warfare and thus needs to adapt to the future as warfare evolves. It would not be amiss at this point to discuss the future of warfare in order to determine what wargaming might look like in the future. There are primarily two competing theories of future warfare that are considered today.⁹

- **Evolutionary Theory:** This theory envisions a steady improvement in precision weapons, aircraft, ships, armored vehicles, and command and control systems. The fundamental force structure would remain more-or-less the same, though its capabilities would substantially grow. These improvements would not drastically alter the way war is conducted in the future.
- **Revolutionary Theory:** This view envisions radical changes based primarily on the exploitation of advanced technology. Such a war would focus not only on military assets but also on a plethora of the adversary's civilian and military leadership, national power, etc.

It can be argued that events on the battlefield have demonstrated that warfare evolves as a dynamic mix of the two theories. Technology gives us efficient domain awareness and weapons and at the same time coherent and intangible factors force us to innovate war fighting. The spectrum of war is wide and dynamic and hence so is the response to it by war fighters and planners. This then poses the question of how wargaming will deal with this evolution (or revolution) in the future. It is common for military planners to establish their wargaming techniques using the traditional approaches, as prediction of revolutionary changes in warfare is fraught with uncertainty.

⁹Kenneth Watman, "Wargaming and its Role in Examining the Future," *Brown Journal of World Affairs*, Volume X, Issue 1, Summer/Fall (2003): 51-61

System on System Model of Wargaming

The world grows complex with each passing day and so do the problems facing the decision makers. It would not be too far off the mark to predict that wargamers (designers and participants) will be increasingly asked to develop complex scenarios that provide a significant departure from conventional ‘force on force’ scenarios. The next level of wargaming could be the ‘System on System’ wargaming, which is based on the Five Ring System Theory (Figure 1) established by Col John Warden, USAF in ‘Air Theory for the Twenty First Century’.¹⁰



Fig 1: Five Ring System Theory

Descending in order of importance from the innermost to the outer most ring is: (1) a leadership ring that controls the system or state, (2) a system essential ring that provides or represents key production that is critical for state survival, (3) an infrastructure ring that ties the entire system together, (4) a population ring composed of the state’s civilian population; and (5) a fielded forces ring or fighting mechanism ring that defends the state from attack. Col John Warden, USAF, believes the object of war is to induce the enemy to do [one’s] bidding; one can more effectively and efficiently accomplish this objective by rapid,

¹⁰ Peter Garretson, "Thoughts on the Future of Wargaming," *USDoD Modelling and Simulation Conference*, no. March (2008)

simultaneous attacks on the enemy's inner ring: leadership. Only if one is unable to attack an enemy's leadership does Warden recommend attacking, in ascending order of importance, the latter rings.¹¹

Therefore, considering that tomorrow's battles will be pitching systems against systems, wargaming models will have to evolve to cater for this depth of design and participant response. Limiting wargames to military confines may well provide erroneous outputs and predictions. The 'System on System' approach to wargaming is, by present estimates, most likely to evolve into a valuable tool for display and quantification of cascading effects and providing specific tools in the complete spectrum where decision support is needed by the planner.¹² A future wargaming scenario is likely to be a construct where the realms of Constructive, Live and Virtual gaming will intersect in the overarching environment of a Five Ring concept. Some intended benefits from such a developing model of wargaming could be to:-

- Predict and project elements of instability in a scenario.
- Train planners and tacticians in dealing with complex tasks and understanding effect-based environments.
- Enhance the level of intelligence distribution.
- Improve strategic insight and resource optimizing skills.
- Assess value of strategic action and deterrence.
- Discover new unintended models.
- Facilitate wargaming to forecast and predict.
- Explore decision trees and matrices.

¹¹Gary M Jackson, "Warden'S Five-Ring System Theory: Legitimate Wartime Military Targeting or an Increased Potential to Violate the Law and Norms of Expected Behavior?," *Air Command and Staff College, April (2000)*,

¹²Peter Garretson, "Thoughts on the Future of Wargaming," *DoD Modelling and Simulation Conference, no. March (2008)*

Conclusion

Warfare today covers a wide spectrum from theatre level war to small-scale contingencies. There are known and visible enemies and there are non-state actors. There are predicted threats and then there are surprises. The nature of warfare is dynamic and so is the response in the form of warfighting. There is no 'one size fits all' solution and it therefore becomes imperative that wargaming adapt to this scenario and introduce a level of complexity and dynamism into the design, execution and adjudication aspects of wargaming. Change is not welcome but it is necessary.



About the Author



Captain Susheel Menon was commissioned into the Indian Navy in July 1992. In his early tenures he has served on INS Kakinada as the Gunnery Officer and as the commissioning crew of INS Gharial. He commanded IN TRVA-71 in 1998. He is a Gunnery specialist and served on INS Ranvijay and INS Talwar. He underwent the Staff Course at the Naval Command and Staff College, Jakarta, Indonesia, in 2006. He has served as the Fleet Gunnery Officer of the Western Fleet from 2006 to 2008 and thereafter served at Naval Headquarters in the Personnel Branch for two years. He was the Executive Officer of INS Mumbai in 2010 prior to taking over command of INS Kirpan in 2011. The officer has completed his Higher Command Course at the US Naval War College, Newport, and thereafter joined as Directing Staff at NWC, Goa, in July 2013.