

The International Journal of Intelligence, Security, and Public Affairs

ISSN: 2380-0992 (Print) 2380-100X (Online) Journal homepage: <http://www.tandfonline.com/loi/usip20>

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To cite this article: Roger C. Mason (2018) Wargaming: its history and future, *The International Journal of Intelligence, Security, and Public Affairs*, 20:2, 77-101, DOI: [10.1080/23800992.2018.1484238](https://doi.org/10.1080/23800992.2018.1484238)

To link to this article: <https://doi.org/10.1080/23800992.2018.1484238>



Published online: 25 Jul 2018.



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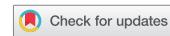


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Wargaming: its history and future

Roger C. Mason

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ABSTRACT

Wargames have captured the imagination of persons seeking a competitive edge over their opponents. For over a thousand years people have used games to analyze problems, develop solutions, and train problem solvers. This paper reviews critical developments and innovations in the history of wargames. Wargames provide an opportunity to test hypotheses, offer alternatives, solve problems, and stimulate innovation. Wargames continue to offer opportunities to understand possible future states and develop compatible decision models

ARTICLE HISTORY

Received 7 December 2017

Revised 24 May 2018

Accepted 29 May 2018

KEYWORDS

Wargame; simulation;
planning; prediction; model

Introduction

What is a wargame? The term can evoke a wide variety of concepts and ideas. The term wargame can also frighten us by its dark connotations or lure us by promises often based on mythology. It is important to begin with a clear definition of the term.

‘(Adversarial by nature), a wargame is a warfare model or simulation, using rules, data, and procedures, not involving actual military forces, and in which the flow of events is affected by, and in turn affects, decisions made during the course of those events by players representing the opposite sides.’

Dr. Peter Perla *The Art of Wargaming*

To understand wargames we must review the origins and applications of the concept throughout history (Perla 1990). By starting with the past, we can understand the wargame’s origins, eliminate the myths, and establish a solid foundation for evaluating its future.

Ancient origins

The ancient Romans played board games. From the Ancient Egyptian game of Senet (a backgammon-like game) to games of chance, the Romans loved games. The Roman game called Latrunculi was known as the “the game of soldiers.” The game was similar to chess employing a board with a grid to

mark the positions of the playing pieces and track their movement. The game begins with each side lining up their pieces (or army) along the rear row of squares. Each player had a king represented by a pyramid-shaped playing piece. (Matz, 2002)

In 1996 an archeological excavation of a Roman Britain gravesite uncovered a copy of the game. The game board was wooden and hinged for easy storage. The playing surface had a grid of 12×8 squares with white and blue glass playing pieces. The pieces were flat on the bottom and raised on the top (Merrick, 2016).

Through the end of Roman Empire to the beginning of the Medieval period games remained popular. Chess appeared in Northern India around the 6th century. An Indian philosopher named Sassa invented the game as a pastime for royalty. The game was originally called chaturanga. Merchants and traders carried the game which eventually spread from Persia to Europe. The Moorish invasion of Spain introduced chess to southern Europe. The Normans were chess players and took the game to England. The game featured simple rules, playing pieces that reflected familiar societal/military structures, and opportunities for strategy (Murray, 1963).

European games

The literature of medieval and renaissance Europe is full of references to chess (Degroot, 2016). Medieval poetry described people playing chess and illuminated manuscripts portrayed chess play. One of the most noteworthy from the 1300s was Jacopo De Cessole's *De Moribus Hominum et de Officiis Nobilium Super Ludo Scaccorum*. This title translates to “*About the Game of chess of the customs of men and the Noble actions involving the game of chess.*” In 1474 William Caxton published an English translation of Jean de Vigny's *The Game of Chess*. (Caxton, 1883)

One of the most popular strategy games of the medieval period was Rithmomachia, also known as the “game of numbers” (Von Hilger, 2012). The game was based on Pythagorean number theory. It is unclear who designed the game with some contemporary scholars attributing it to Pythagoras. In 1013 a monk named Aliso who produced the game and a manuscript titled *Boethius De Institutione Arithmetica*.

The game also had serious uses. Two German cathedral schools, Wurzburg and Worms, were competing for pupils and ultimately the favor of the Holy Roman Emperor Conrad II. Conrad declared a competition be held using the game of numbers to settle the issue (Masi, 1983).

The game was an elongated chess style board with movement squares and playing pieces marked with numerical values. Players used mathematical formulas to produce a higher number than their opponent to win

engagements. Each player had a pyramid-shaped token that represented their most valuable playing piece. Interest in using chess as a foundation for wargame design continued (Von Hilger, 2012).

In the mid-16th century, the first departures from the chess approach to game design appeared. (Wintjes, 2015) Reinhard zu Solms was a military engineer and artillery expert from Hesse. He gained experience by signing on with various military expeditions. Solms eventually came to the court of Charles V.

Solms was very familiar with the problem of military education for the upper classes. He observed that young counts and princes wiled away their time in frivolous pursuits. The young royals were often unprepared to serve as officers in the military when drafted. His approach was to develop a wargame that princes could use for leisure pleasure but acquainted them with tactics and strategies critical to military operations.

Solms approached military education by writing a collection of technical volumes about military affairs titled *Kriegbeschreibung* (Description of War). In 1535 the first edition was followed by a second edition in 1556. Solms' multi-volume encyclopedia of military science provided technical information and advice about issues from casting cannons to building fortifications. Volume 7 was devoted to wargames.

Solms included a game he called the Kartenspiel (Card Game). The game uses cards to depict military units and leaders. The cards were colored and came in different sizes indicating the size of or importance of a unit or a leader. There were 21 types of individual cards representing types of infantry, cavalry, and artillery. Solms used colors to differentiate the cards.

The use of various sizes of cards allowed for the breakdown or buildup of units. (Ex: A large cavalry unit card could be broken down into several smaller cavalry unit cards). Some cards depict the same unit in various formations such as marching in formation or advancing in combat. Professor Jorit Wintjes argues that Solm's Kartenspiel was "a step ahead with regards to realism. Therefore it is best called a proto-wargame." (Wintjes, 2015)

Gottfried Leibniz was mathematician and philosopher born in 1646. He was a contemporary of Isaac Newton and shares the credit with Newton for developing Calculus. Leibniz was very interested in the idea of games. In 1710 he wrote a paper titled *Annotatio de Quibus Ludis* (Annotations about Games) where he discussed several games including the Chinese game of Go. Leibniz said, "I strongly approve of the study of games of reason, not for their own sake, but because they help to perfect the art of thinking." (Leibniz, 1697; see also Ronila, 2007)

Leibniz proposed that games can instruct about life. In his paper titled *The Ultimate Origin of Things* (Leibniz, 1697) Leibniz states

A different and perhaps better analogy is provided by

certain games, in which all of the pieces on the board are supposed to be filled in accordance with certain rules: Towards the end of such a game a player may find he has to use some trick if he is to fill certain places that he wants to fill. If he succeeds in filling them, but only by resorting special measures he has achieved maximal results but not with minimal means.

In 1644 Christopher Weikmann in Bavaria became interested in designing a recreational game that could teach military principles. His game was called the “King’s Game.” (Von Hilger, 2012) The design retained some features of chess with a board and playing pieces. It included 14 types of military playing pieces. Each player began the game with 30 pieces. Each piece had different movement rates and combat capabilities. Contemporaries often referred to Weikmann’s invention as “war chess” (Vego, 2012).

In 1806 a Bohemian banker named Johan Opiz developed a strategy game using a map with terrain squares. The game had detailed rules covering a wide variety of issues from movement to combat. The scale of the game used the average size of a battalion of soldiers. This game is noteworthy since it is one of the first game designs to employ dice to randomly generate combat results (Opiz, 1806).

Kriegspiel

In the late 18th century the first significant departure from chess appeared. Ludwig Hellwig worked as a scholar for the court of the Duke of Brunswick. In 1790 Hellwig developed a game for the instruction and recreation of young noblemen. Hellwig started with the standard chess style pieces but introduced artillery into the game.

Hellwig expanded the playing area from the standard 64 squares on a conventional chess board to 1617 squares with 49 ranks in 33 files. The board could include four types of terrain features: open space, mountains, forests, or water. Each player began with the game with 104 pieces. Players could design fictitious or historical scenarios. Hellwig called the invention a “kriegspiel” or wargame (Vego, 2012).

Beginning in 1797 Hellwig’s game was modified by Georg Venturini, a military theoretician from the State of Schleswig (Harrigan & Kirchenbaum, 2016). Venturini adopted the basics of Hellwig’s game but transferred the game boards to actual maps with a grid system where each grid represented one square mile. Venturini was especially interested in the terrain along the borders of France and Belgium. The rules included movement, weather effects, and logistics. Venturini designed the game as an instructional tool and called it the “New War Game” (Neues Kriegspiel) (Sayre, 1908).

While Ludwig Hellweg was working on his board game the Englishman, John Clerk, was considering naval tactics. Clerk published his treatise on naval tactics in 1797. Clerk designed a tabletop game system with wooden blocks representing individual ships. Clerk recognized the inconclusive nature of many large naval battles. He experimented by gaming new tactics he believed would be decisive (Clerk, 2008).

Clerk had numerous critics in the Royal Navy who pointed out he had never served at sea in any capacity and were skeptical of his game. Clerk admitted he had never been to sea but claimed his game system validated his conclusions. Clerk described his game saying “The use of a number of small models of ships when disposed in proper arrangement, gives the most correct representations of hostile fleets.” Royal Navy Admirals Rodney and Nelson studied Clerk’s writings. They reportedly used Clerk’s tactics to win the Battle of the Saintes, the Battle of the Nile, and Trafalgar (McHugh, 1966).

The Prussians were interested in developing military instructional games. In 1812 Georg Leopold von Reisswitz began developing a tactical game which employed a sand table with wooden blocks for playing pieces. Von Resisswitz introduced the concept of the fog of war into the game. Players were only aware of their opponents once the units had come in contact. The players submitted written orders to an umpire who consulted attrition tables based on factors such as terrain effects or firepower. The game was demonstrated for King Friedrich Wilhelm III who approved of the concept (Caffrey, 2000).

In 1824 development of the game continued with Reiswitz’ son Georg Johan. The junior Reisswitz introduced the use of colors for the playing pieces and a map with terrain. The game expanded from a tactical setting to a more flexible system which could accommodate larger formations. By incorporating larger formations, higher levels of military command could become involved.

Further improvements included expansion of the rules and connecting combat results with combat effects. Chief of the General Staff Karl von Mueffling officially adopted the game for the Prussian Army (Addington, 1971). Mueffling combined the use of staff rides, seminar discussions, and wargaming for training and planning. The changes were popular and wargaming became a fixture for the Prussian Army.

Free kriegspiel

The Reisswitz game had a mixed reception throughout the Prussian army. One problem was playability. The game had lots of rules, and many military organizations sometimes struggled to play the game. The playability issues were further complicated by attempts to provide additional rules and improve methods for calculating losses. Critics noted a kriegspiel often took longer to play than some actual engagements.

Colonel Julius von Verdy du Venois recommended that umpires instead of rulebooks should govern play. He believed gameplay could be simplified and the pace of play improved. In 1876 Verdy du Vernois published the “Contribution to the War Game” which replaced attrition tables and rules with decisions by umpires (Curry, 2008c).

Another Prussian development was the differentiation of the levels of games into small, large, and strategic. The smaller games typically involved company level units and were used for training at regimental headquarters. During the winter, regular field training was replaced by wargaming. Division size units ran the large wargames. The division level games included organizational problems like transportation and logistics. The Prussian General Staff employed strategic games with corps and army size units.

The Prussian chief of the general staff, Helmuth von Moltke, embraced wargames for instruction, training, and planning (Goerlitz, 1953). The success of the Franco Prussian war established wargaming as a useful tool for training and planning (Howard, 1961). Moltke supported the free kriegspiel approach placing greater faith in the experience and background knowledge of umpires over rules and the throw of dice (Sayre, 1908).

In Britain wargaming was more of a recreational hobby. Fred Jane was an avid naval miniatures player. He was the founding editor of an annual reference book on warships called “*All the World’s Fighting Ships*.” In 1906 he published a Naval War Game that had limited interest from the Royal Navy. Combatant countries who were interested in Jane’s game were Russia and Japan (Curry, 2008b).

In the preface to his game Jane mentions Grand Duke Mihardovitch of the Imperial Russian Navy and Lieutenant Kawashima for their interest in reviewing the rules and development of the game (Curry, 2008b). This may have been the beginning of Japanese naval wargaming. Japan reportedly bought copies of the game and asked Jane to train a team of officers to use it.

The Russians were also wargaming a possible conflict with Japan. In the winter of 1902–03 wargames were played at Nicholas Naval Academy. The outcome identified a strong possibility of a Japanese surprise attack. The game also predicted Japan might use new technology on Russian capital ships such as their torpedo weapons. One year later the wargame results would prove prophetic with the Japanese employing a surprise torpedo attack on Russian battleships and cruisers in Port Arthur (Pleshakov, 2002). The Russian General Staff carefully reviewed their wargames to determine if they impacted the conduct of the war. They determined the games lacked imagination, were too rigid, and needed better-trained umpires.

World war one

Governments and military leaders across Europe could see the potential for a major European war was growing. The expansion of standing armies, revised mobilization schedules, and improvements in transportation increased the potential for war.

With the possibility of war looming two issues were facing the major European powers: mobilization planning and the initial deployment of forces. Countries wanted to know if their mobilizations plans would work and how the mobilized forces could be best employed. Russia, Germany, and Great Britain used wargames to consider these problems.

Russia

The Russian Army was enormous. Their wargames indicated resources were insufficient to equip and supply the entire army. It was better to fully support two field armies than mobilization of the entire army. The second issue involved how to invade East Prussia. The Masurian Lakes was a barrier that forced the Russians to divide their forces. One army would sweep north while a second army swung around the southern tip of the lakes. The wargame indicated the geography could prevent the armies from supporting each other. It also revealed the Germans could use this barrier to defeat each army in turn.

Germany

The Germans were facing threats from a potential Russian invasion in the east and the French and British in the west. The eastern risk was wargamed. The German wargames identified the same geography issues as the Russians. The Germans modified their plans to rapidly concentrate their forces using their efficient rail system.

Count Alfred Von Schlieffen led the General staff after Moltke. His plan for winning a two-front war evolved as planning and wargaming continued. The original plan involved a decisive battle against the French which allowed the Germans to pivot and defeat the oncoming Russian armies. Von Schlieffen concluded the Russo Japanese war revealed major organizational issues in the Russian Army which made them weaker than they appeared. Schlieffen adjusted the strategy to a wide sweep through Belgium and the Netherlands that outflanked the French while concentrating the eastern forces on one Russian army at a time (Zuber, 2011).

Schlieffen's 1905 wargame revealed significant logistics problems keeping the flanking armies supplied. The game predicted the French would advance towards Luxembourg allowing the Germans to repeat the encirclements of the Franco Prussian War. In 1906 Von Schlieffen was succeeded by Helmuth von Moltke, who was the nephew of Field Marshall Helmuth von Moltke.

The nephew was also known as Helmuth the Younger. The new chief of the general staff added a new wrinkle to German wargaming by actively planning and wargaming solutions for the French army. These operational solutions were then used to examine German planning.

Once the war began some post-Franco Prussian war observations by Moltke the elder began to haunt the Germans. The senior Moltke had observed the results of engagements might form the basis for a new strategic decision because victory or defeat may influence a person's ability to see beyond the first battle.

Moltke's famous saying "no plan survives first contact with the enemy" was proven in the first months of fighting.

The Germans continued wargaming during the war culminating with planning for their final 1918 offensive. The game results predicted the chances of success were slim. The results of the game did not prevent the Germans from attacking one last time.

Great Britain

After limited interest, the British General Staff finally began wargaming their possible involvement in a major European war. In 1905 a game was played based on the scenario of an indecisive French and German engagement along their borders followed by flanking attack by the Germans through Belgium. The game revealed inadequate resources for the rapid transfer of the British Expeditionary Force to France. The British followed up by modifying their mobilization plan, strengthening their sealift capability, and opening discussions with the French General Staff regarding combined planning. (Beckett, 2001)

The First World War validated some of the prewar game predictions. The Russians were defeated in detail, fighting north and south of the Masurian Lakes (Goerlitz, 1953). The Germans sweeping offensive through Belgium fell short caused in part by the problems of supply. The British were able to mobilize and deploy their army to France much more effectively. Finally, the 1918 German General Staff wargame was correct that final victory would be elusive.

Inter-war period

As soon as the First World War ended military planners were looking ahead to the next conflict. Germany, the United States, and Japan employed wargames to give them a look at the future.

Germany

After the First World War, the German army was reduced to a fraction of its former size. German military leaders focused on possible future conflicts

(Dupuy, 1991). To close the gap between current capabilities and potential conflicts the generals turned to wargaming.

Wargaming allowed the Germans to explore tactics and strategies for weapons like submarines, tanks, and airplanes.

The Chief of the German Army was Hans von Seeckt who was an active exponent of war of maneuver (Goerlitz, 1953). The Seeckt believed that officers could be introduced to the concepts even when the weapons systems were unavailable. Seeckt encouraged the development of operational games with the next generation of weapon systems (Vego, 2012).

The Germans developed a variety of wargames employing different learning objectives. Tactical games were used to teach small unit maneuvers. Operational games included the requirement of writing simulated unit action orders. The scenarios included potential conflict situations like a border incident with France or Belgium. Officers playing the games became familiar with maps of the terrain along the French of Belgium borders. Some games were intended to train while others were used to test personnel and operational plans (Citno, 1999).

In March of 1938, General Ludwig Beck held a series of wargames focusing on two-front conflicts. The purposes of the games were twofold. First, to identify the problems of fighting on multiple fronts and secondly to determine if this was practical. The games indicated the Germans could not sustain a multi-front conflict. The conclusions were presented to Hitler who dismissed them as “childish” (Van Creveld, 2013).

In the spring of 1939 German military planners were well aware the possibility of war was increasing. Hitler ordered the immediate completion of the Polish invasion plan. Each of the military services developed separate but coordinated plans for the attack. The planners had serious concerns an invasion of Poland would trigger treaty responses by France and Britain (Kennedy, 1956).

Field Marshals Von Rundstedt and Bock suggested the attack plans be wargamed. Field Marshall Keitel, chief of the German armed forces, approached Hitler with the request. Hitler dismissed the idea stating it might endanger ongoing diplomatic negotiations.

US navy war college

In the 19th Century, the United States exhibited varying levels of interest in wargaming. Alfred Thayer Mahan was a naval captain with an intense interest in strategy. He served as president of the Naval War College for two terms in the late 1880s. He hired a retired naval officer, William McCarty-Little, as part of the faculty (McHugh, 1966). McCarty-Little introduced wargaming to the curriculum. During his 30 year career as a faculty member, he wrote about wargaming and introduced hundreds of naval officers to wargaming (McCarty Little, 1912).

In the 1920s the US Navy was very interested in a possible conflict with Japan in the Pacific. A series of war plans were developed and wargamed at the Naval War College (Nofi, 2010).

These wargames tested ideas and served as the foundations for the successful strategies of the World War Two Pacific War.

Japan

Planners at the Tokyo Naval War College were very interested in wargaming possible operations against the United States Navy. The first games were remarkably similar to the early US Navy War College scenarios. The scenarios predicted a strong push by the Americans across the central Pacific. The Japanese strategy involved gradually falling back to stretch the American's logistics. The decisive sea battle would require the Japanese main force striking the Americans and defeating them in the western Pacific. The Japanese would follow the Americans as they retreated to Hawaii and Midway.

World War Two

In the immediate period leading to World War Two, three countries were committed to wargaming: Japan, Germany, and the United States. Techniques developed during the First World War were the basis for design and gameplay in the 1930–40s. Countries with established wargame practices continued to use them while nations who previously ignored wargames did not develop them. During the war countries that critically analyzed game outcomes had more success than nations looking for confirmation of their planning.

Japan

The Japanese were interested in the development of wargames as a platform for discussion and analysis. The Japanese looked at a variety of issues related to outcomes of a world war. The Japanese Navy wargamed their early decisions in the Pacific war. The first wargame covered a possible surprise attack on Pearl Harbor. It determined that careful surveillance by the US could result in significant Japanese losses. The plan was reworked to minimize discovery of the approaching Japanese task forces.

In 1940 the Japanese established the Total War Research Institute. The institute reported to the prime minister. In August of 1941, the institute ran a wargame simulating two years of political, economic, and military conflict involving the Axis and Allied powers (Ichikawa, 2008). The first part of the game examined if a war was inevitable. The conclusions of the game were Japan would lose a war with the US based on a variety of economic factors. The report was immediately classified top secret and kept from the public.

Ayukawa Yoshisuke was founder and president of the Nissan and Hitachi companies. In 1943 Yoshisuke established a business wargame branch specifically involved in wargaming post-war recovery issues. This was eventually determined to be too defeatist by the military government and closed (Ichikawa, 2008). Yoshisuke resigned but attempted to continue his gaming research by establishing the Giseiki institute for economic-business gaming. The Institute was eventually closed as well by the government.

The Japanese wargamed the attack on Pearl Harbor, the invasion of the numerous targeted islands, the attack on Midway and a possible offensive in the Indian Ocean. Mitsui Fuchida described the Midway wargame as biased in favor of the Japanese and restricted from considering any contingencies beyond the basic Japanese expectations of the outcome (Fuchida & Okumiya, 1955).

Germany

The German Navy viewed Great Britain as their natural foe. In the winter of 1938 to 1939 the German submarine force was led by Karl Doenitz. German naval wargames explored the best locations for initial war deployment and evaluated single boat operations versus groups of boats operating in “wolf-packs.” The outcome of the games influenced the final deployment locations and operational plans (Doenitz, 1959).

The German general staff was interested in wargaming the various campaigns being proposed by Adolf Hitler. The general staff were especially interested operational issues such as logistics. The German Army wargamed the 1940 Ardennes offensive which indicated a favorable outcome. Hitler appreciated the outcome of the 1940s game but was generally dismissive of games calling them “pseudo intellectual.”

In February of 1941, the Germans wargamed Operation Otto which was the first code name for an invasion of Russia. The staff of Army Groups South and North conducted extensive wargames. The games projected major losses for the Russians and a favorable outcome for the campaign.

During the games the German players had significant problems with unexpected losses and difficulties eliminating large formations of bypassed Russians. The conventional wisdom was these problems could be addressed by surprise, closer cooperation between the army and air force, and the willingness to drive deeply without fear of protecting the flanks.

As the invasion occurred The Germans began questioning the validity of their games.

The biggest shortcomings were the game scenarios. The designers had miscalculated the actual size of the Soviet army. Combined with the operational delays, the Germans were forced to fight an increasing number of Russians. This and the harsh weather on the Eastern Front combined to defeat the German army (Kirchubel, 2013).

US and Britain

The US and British armies did not do much wargaming during World War Two. Field Marshall Montgomery reportedly conducted limited staff wargames of his plans during the North African campaign. Wargaming continued at the US Naval War College. The Royal Navy took an interest in wargaming.

Ensuring a continual flow of supplies from the United States to Britain was a critical problem. The merchant convoys were under relentless attack by German submarines. A war room for convoy operations was opened in Liverpool. The Western Approaches Tactical Unit (WATU) was established to analyze convoy operations and develop anti-submarine tactics (Strong, 2017). Wargames were played on a plotting floor which could be used to simulate a single convoy or actions involving the entire north Atlantic. The war in the North Atlantic was an example of two opponents wargaming a conflict against one another.

Cold war

The cold war offered strategists, political leaders, and wargamers a new set of problems. The challenge was the new age of nuclear weapons where strategic warfare might truly be a global zero-sum game. World wars had proven incredibly destructive, but they had taken five to six years to play out. The nature of nuclear war meant the fighting and resulting destruction might take place in hours (Allen, 1987; Wilson and Curry, 2014).

The second problem was an operational mistake would no longer result in localized damage or temporary violation of international boundaries but could result in the deaths of millions. Wargamers moved beyond tactics and operational issues. They began exploring strategic military and political threats related to the use of nuclear weapons (Cornwell and Allen, 1982).

RAND

The US became the leader in Cold War wargaming. The effort was initially led by the RAND Corporation which started as a think tank for the US Air Force. Beginning in the late 1940s Rand began wargaming the possibilities of conventional and nuclear war with the Soviet Union. In 1954 they conducted a wargame of a total nuclear war. RAND developed a wargaming facility and team codenamed Project Sierra. RAND developed political military games, conventional manual board games and some of the first computer games and simulations (Ghamari-Tabrizi, 2005).

In the 1960s the US Department of defense developed a wide variety of wargames to support different planning functions through their service components.

HUTSPIEL was a wargame designed for the US army regarding the employment of tactical nuclear weapons on the conventional battlefield (Schader, 1962). The scenario covered a conventional campaign along the Rhine between NATO and the USSR. During the game tactical nuclear weapons were introduced.

TEMPER was an early computer game designed by the Industrial College of the Armed Forces. The Air Force was interested in nuclear war. BIGSTICK was a nuclear warfare game designed for the Air Command and Staff College. The game supported the college's nuclear war planning curriculum. Students employed conventional wargaming techniques to develop a course of action. The game used standard maps and charts with a computer determining the combat results (Kalili, 1988).

Warsaw pact games

From the mid1950s until the fall of the Berlin Wall the Soviet Unions conducted wargames with their Warsaw Pact allies (Mastny et al. 2001). These games were a combination of troop movement exercises and tabletop exercises. The exercises and games were conducted in spring and summer. One of the most common scenario topics was a NATO surprise attack on the forward edge of Warsaw Pact Forces (Mastney, 2016).

Throughout the 1950s and '60s, the United States was very involved in wargaming. The Johnson Administration in 1964 commissioned the Sigma wargames to explore the possible outcomes of long-term conflict in Southeast Asia. These games remain classified, but the available information indicates the first game predicted a possible stalemate for the US. The game was reorganized and replayed with marginally more favorable results.

While the Soviets were concerned about a NATO surprise attack on Warsaw Pact forces, Washington DC was concerned about the potential for a Russian decapitation attack. This attack would be designed to remove the leadership of the United States. In 1982 the Reagan administration held a wargame codenamed "Ivy League." The game involved the White House Situation Room and the Pentagon.

A second Reagan era wargame called Able Archer '83 has become a famous example of art nearly dictating life. In 1985 NATO decided to conduct an actual movement of forces from the US to Europe as part of the annual REFORGER (Return of Forces to Europe). Combined with these maneuver exercises was a test of a new NATO command and control system. The Soviets monitored the exercises. They became concerned the exercise was a cover for the preparations for an actual surprise attack in Europe. NATO was unaware the Soviets were contemplating preemptive strike until months after the exercise (Jones, 2016).

Confronting insurgencies through gaming

In the early 1960s, the US Army was developing weapons systems and tactics for low-intensity conflict. This interest grew, and the war in Southeast Asia began to intensify. The US Army had a successful conventional wargame system called TACSPIEL. It was designed to test operational doctrine involving potential conflict between NATO and the Warsaw Pact. The Army's operations research committee asked the Research Analysis Corporation (RAC) to modify TACSPIEL for low intensity, counter-insurgency conflicts (Curry, 2008a).

The Army was working on new organizational schemes, weapons, and tactics. As the problems of fighting an insurgency in the jungles of Vietnam became clearer the need for new operational solutions also grew. The US Army was particularly interested in the use of helicopters in a new operational approach called air cavalry. RAC modified the conventional TACSPIEL system from division level combat to platoon and company level operations with a specific focus on air mobility tactics.

The first scenario for Vietnam operations involved air cavalry support of a conventional Army of the Republic Vietnam (ARVN) division fighting local Viet Cong units. The game typically employed 6 hours per game cycle or turn. Each combatant commander would submit orders to a controller who would determine when or how contact between forces had occurred. The game included charts identifying weapons systems capabilities, detailed movement rules, and combat results.

TACSPIEL had a very unusual history. It was played for three years from 1965 to 1968. The game had two objectives. The first set of games was played based on the evolving situation in the field. The second gaming group repeatedly played the game to improve its performance as a gaming system. The improvement group's goal was to provide operational planners the best test and evaluation tool possible. The US Army was very satisfied with the TACSPIEL game system. The realities of the politics related to the war effort overshadowed the value of the game.

After the Vietnam War the British Army was very interested in counter-insurgency conflicts. Paddy Griffith was an instructor at the Royal Military Academy at Sandhurst.

He developed a series of counterinsurgency games used for training cadet officers. Griffith's wargames serve as a foundation to much of the current British army use of wargames (Curry & Griffith, 2016).

Commercial wargaming

In 1953 Charles Roberts founded the Avalon Game Company which was renamed the Avalon Hill Game company in 1958. Avalon Hill specialized in wargames and strategic board games. The company pioneered the use of hexagon grid overlays of maps and concepts like zones of control, geomorphic map boards, and odds-based combat results tables. Avalon Hill published dozens of games which were popular with the public. Roberts was the original designer of the company's games. He was joined by James Dunnigan who quickly became one of the most celebrated game designers in history.

In the 1970s James Dunnigan founded Simulations Publications, Inc. (SPI). SPI began by publishing a magazine called Strategy and Tactics. The magazine was ground breaking because it offered a new wargame in each issue. Dunnigan designed a series of wargames that are recognized as some of the most innovative commercial wargames ever produced. He remains one of the most influential commercial wargaming designers, writers, and wargame theoreticians (Dunnigan, 1992).

In 1988 Decision Games purchased the rights to Strategy and Tactics and many of the SPI games. An estimated 200 wargame companies are currently producing commercial wargames worldwide. Many analog wargames were converted to computer games. Computer games offered the convenience of an automated opponent but lacked the socialization factor that has remained a key draw with many hobby wargamers. In the past two decades Joseph Miranda has served as Decision Games' leading designer. Miranda holds the record for the number of commercially produced games with nearly 400 wargames.

The term "serious games" is sometimes applied to games with a purpose other than entertainment. This was principally defined as computer games offering immersive learning environments. Critics labeled these games as video games re-purposed for training. Computer wargaming has been valuable for developing simulations depicting fluid situations such as flying or ground combat (Aldrich, 2009).

Oil wars

With the First Gulf War the attention of the world focused on the nations surrounding the Persian Gulf. Wargaming accompanied the military planning and warfighting.

Gulf war one and two

On 1991 Iraq invaded neighboring Kuwait and caused a major crisis in the Persian Gulf.

The United States military immediately turned to wargames to help craft a response to the attack. The first step was adopting a commercial wargame designed by Mark Herman called Gulf Strike. Gulf Strike was a manual wargame about a hypothetical conflict in the Persian Gulf. Within days the game was being played at the US Central Command (CENTCOM) headquarters in Tampa Florida and the Pentagon (Dunnigan, 2017).

The United States military established wargame teams at Central Command Headquarters, the Pentagon, and forward deployed in Saudi Arabia. A variety of manual and computer games were employed to explore decision and planning options. The topics included: logistics, air operations, sealift planning, and war termination. The three locations conducted games throughout the entire campaign.

The US Marine Corps employed manual and computer wargames to evaluate their combat and logistics options. The Marines conducted a strategic wargame to explore the problems related to moving large formations and their logistics from the US to the Persian Gulf. The Marines also employed wargames to evaluate operational issues like breaching the Iraqi frontline fortifications.

The US Army employed a game called TAC WAR. TAC WAR was a computer simulation where different situations and scenarios could be programmed and played. There were no autonomous players in the game with both combatant commands represented within the computer program. The game included logistic issues and could be played or employed in one day to multiple day scenarios.

Defense planners compared the gaming results from TACWAR and the Marine Corps manual and computer games. The results were very similar. This validated the process of connecting wargaming analysis to operational planning. It also provided confidence to the commanders relying on the games (Zenko, 2015).

Games and the 21st century

In the 21st century interest in games for analysis and decision making has increased. A variety of disciplines in the public and private sectors use political-military and matrix games (Zenko, 2015).

Pol-Mil games

Pol-Mil is a shortened version of the term political-military games. Pol-Mil games incorporate political and military factors in a conflict simulation. The Germans were the first to attempt this. German military planners recognized that political factors weigh heavily in the outcome of any military venture. In the 1920s the Germans experimented with games

that included their Foreign Ministry and simulating related organizations like the League of Nations.

In the 1950s RAND Corporation began developing “politico-military desk games” also known as crisis games. RAND researcher Herbert Goldhamer proposed that

politico-military games should employ minimal formalization, emphasize uncertainty, and be based on plausible scenarios. Most of the RAND scenarios focused on the threat from the Soviet Union and the Warsaw Pact (Gahmari-Tabrizi, 2000).

By the end of the 1950s, Berlin was an international flashpoint. The Eisenhower Administration looked to the Pentagon for decision options for dealing with a Berlin crisis. RAND and MIT developed “The Berlin Game.” It was used by Pentagon planners to consider possible military and diplomatic responses to a potential Soviet attack on Berlin. Thomas Schelling recalls the Berlin Game was very comprehensive because military and diplomatic planners had been carefully considering possible variables of a Berlin crisis for several years prior (Levine, Schelling, & Jones, 1991).

The next major crisis to face the US was the 1962 Cuban Missile Crisis. This scenario was never wargamed because no one expected it could happen. Thomas Schelling said, “And, as so far as the Cuban missiles are concerned hindsight does not show that we should have expected the crisis. A game in this case would have shown its improbability; a game was not needed to show its possibility.” (Levine et al., 1991)

The United States became increasingly interested in Pol-Mil games. By the 1970s the US Navy was running three weeks long Pol-Mil games involving hundreds of military and civilian personnel (Sabin, 2012). One of the recent developments is the use of video gaming techniques including the use of avatars in the Joint Capstone exercises of the USAF Air Command and Staff College. Many NATO countries employ Pol-Mil games. The system remains a staple design of US military and diplomatic gaming.

Matrix games

In 1988 an American psychologist Chris Engle designed a new game system called Matrix Games. The game has a scenario with a series of problems. The players take turns offering a Course of Action (COA). The COAs include supporting arguments why it would be successful. The other players offer their solutions or COAs and then argue which has the best chance of success.

Once the group has made their individual arguments an umpire selects the most likely outcome and declares any related effects. The outcome becomes the factual basis for the next turn of the game (Curry & Price, 2014). The US Army War College uses matrix games in their curriculum. The Canadian Armed Forces have been testing the use of matrix games to determine their value in developing capability requirements for future forces.

Business wargames

The business community has appropriated wargaming and operational research techniques. The Japanese Nissan and Hitachi corporations began business wargaming during World War Two. In the 1950s businesses looked to military/political operations research and scenario planning as a model for business planning. The “future now” planning approaches developed by RAND’s Herman Kahn were adopted by business planners (Ringland, 1997).

Business planners began employing wargames as a system for collaborative communications and decision making. Increasing social and political uncertainty caused business planners to gravitate to wargaming to stimulate collaborative communications and problem solving (Schrage, 2000). Shell Oil invested heavily in their London based scenario planning team (Ringland, 1997). Pierre Wack led the company’s scenario planning team. Wack proposed that scenarios should deal with the world of facts and the world of perceptions to develop strategic insights.

Wack and his partner Arie de Geus pushed the boundaries of future planning from the immediate future to many decades beyond. This allowed for greater freedom and realistic planning. The Shell planners also stepped back from the reliance on computers for answers. They returned to analog techniques with concept mapping. The analog approach allowed the players to interact with the simulation and modify it on the spot (Schrage, 2000). Business planners continue using wargames as a planning and analysis tool with many employing a seminar approach to the game.

Dr. Benjamin Gilad popularized the term “business wargame.” This has proved popular to commercial decision makers who desire to apply the rigorous nature of conflict simulation to their business ventures. Gilad emphasizes the value of role playing in his wargames. This type of gaming has also been applied to the use of intelligence analysis in the business world as competitive intelligence (Gilad, 2008).

Analysis and academics

Throughout the history of wargames, there have been attempts to analyze games and game designs. From Aliso’s 1013 manuscript about Boethius and Rithmomachia to today, people have been writing about wargames. In the late 20th century the first comprehensive history of wargaming was written by Dr. Peter Perla. Perla’s book, *The Art of Wargaming*, covered the history of wargaming and provided the basis for analysis of wargames and gaming. It has served as the inspiration for a growing circle of academics and interested parties in writing about wargames.

Wargames have become part of the academic discourse. Professor Phillip Saban has developed a program for the study of conflict simulation at Kings College London. The King’s College program studies conflict through the simulation of games. Wargaming has also become an essential area of adjunct

studies for intelligence analysis. Juan Carlos University in Madrid has a graduate program in intelligence analysis which includes studying wargaming. Dr. Fernando Velasco and Dr. Ruben Arcos chair this program which places emphasis on wargaming as an analysis tool.

Academics have also pursued the analysis and employment of wargaming for a variety of applications. Professor Rex Brynan at McGill University has led this effort with his PAXsims blog site. PAXsims has raised the level of wargame discourse. Another notable academic is Professor John Curry at Bath Spa University, UK. Professor Curry has developed a program to locate and reprint historical documents and manuscripts related to wargaming. His History of Wargaming Project has restored and republished essential manuscripts and books which were lost and forgotten.

Research and wargaming

There are numerous research projects using games and game techniques. Business, academia, and governments are supporting wargaming. SIBILLA (Simulation of an Intelligence Board for Interactive learning and Loft Achievements) is a web-based strategy game designed to simulate terrorism. The MITRE Corporation has established the National Security Experimentation Laboratory (NSEL) in McClean, Virginia. The mission of NSEL is to provide a laboratory where exercises can be evaluated through computer modeling and simulations.

The Intelligence Advanced Research Projects Activity (IARPA) has developed the Sirius Program. Sirius is designed to help players recognize cognitive biases by experimentally manipulating variables in virtual learning environments. IARPA is interested in using a variety of analytical techniques which include the use of games. The US Central Intelligence Agency continues to employ a variety of game platforms including manual board games (Machkovech, 2017). In Australia, retired Vice Air Marshall John McGarry is leading the development of wargaming for public policy and military planning and research.

The future of wargaming

What is the future of wargames? With a history dating back to medieval roots, there is little doubt that in some form wargames and wargaming will continue. Dr. Peter Perla has explored the possibilities in his essay titled *Operations Research, Systems Analysis, and Wargaming: Riding the Cycle of Research* (Harrigan & Kirchenbaum, 2016). Dr. Perla proposes a three-part approach to critical decision making using a combination of operations research, systems analysis, and wargaming.

Dr. Perla does not overplay the value of wargaming nor underestimate its power to define possible futures for decision makers. Perla's review of operations research and systems analysis describes an approach to problem-solving where things like grand strategy are more about the process and less about the strategy.

Future of games

I believe there are six things wargames can provide the decision makers and problem solvers of the future.

Extending horizons

In the early 1920s, the second generation of dreadnoughts were equipped with aircraft. Aircraft allowed them to optimize gunnery accuracy and identify threats not visible from sea level. As wargames evolve, they will continue to offer the user the opportunity to see beyond their horizon. Wargames will help to limit possible futures and the accompanying hazards allowing the decision maker to focus their response (Bowen, 1978; Hanson, 2016).

Testing hypothesis

Wargames can allow analysts and decision makers to test hypotheses which would otherwise be impossible to evaluate effectively. Robert Levine has pointed out the possibility that the biases of wargame designers can “invalidate games as generators of research conclusions.” Biases of the end users can also invalidate a wargame as demonstrated by the Japanese analysis game of the economic impact of a world war or the German wargame of the Russian campaign.

If a wargame cannot generate research conclusions how can it help? Levine said, “The hypotheses generated by games can be put into two categories: those having to do primarily with the actions, feelings or beliefs for a single side; and those having to do more directly with the interactions of the two sides.” (Levine et al., 1991)

Testing hypotheses can provide a measure of confirmation when the only alternative is hoping you are correct.

Offering alternatives

Intelligence analysts and planners are under increasing pressure as economic, political, social, and military affairs evolve at an accelerating rate. The stress involves identifying the correct challenges and threats. Wargames can decrease this pressure by offering the analyst and decision maker more alternatives. By alternatives, I do not mean the infinite number of potential outcomes but the number and types of threats they can analyze and evaluate.

The alternatives are potential lines of investigation which otherwise might be overlooked (Grendler, 1992).

The 1950s fear of nuclear war is an example of using wargames to look at problems and consequences that might otherwise be ignored. Ghamari-Tabrizi wrote:

Kahn and the other analysts and planners who employed the modes of simulations, painstakingly and repeatedly pointed out the fabricated quality of their enterprise. Yet they justified its legitimacy with the protest that one couldn't be sure that the science was right, only that the science might be right, and that it was the only possible approach at that moment. In the face of charges of arrogance and omniscience, they put the simulation and games of nuclear war in the place of nothing, and proffered uneasy faith.
 (Ghamari-Tabrizi, 2000)

Examining adjunct issues

Intelligence analysis and planning requires focusing all available resources on a limited number of questions. Analytic resources must be focused on the greatest threat. Wargames can allow for the exploratory analysis of adjunct issues that would otherwise have to be overlooked. A wargame can rapidly explore these areas of secondary concern to determine their possible value or potential threat (Cornwell and Allen, 1982).

Offering a stable perspective

Wargames can be applied rapidly and with surgical precision to a variety of problems and analytic challenges. At one time military and political decision makers faced a giant international chessboard where a handful of people could calculate moves and predict outcomes. In the past one hundred years this has evolved into a rapidly changing world. Decision-makers have less impact as a nearly infinite number of individuals can influence global events.

In 1914 Gavrilo Princip's assassination of Archduke Ferdinand resulted in two world wars, a cold war, and the current state of global unrest. Analysts and decision makers can use wargames to define and deal with specific slices of threat combinations. The structure of wargames can offer an analytic perspective that provides a stable platform to define and solve problems.

Provide a source of innovation

Wargames can offer a source of innovation. History reveals some of the greatest innovations in military and business wargaming have come from outside of the conventional military and business world. Opiz's strategy game with game squares and the use of dice for random events, Weikmann's war chess with variable playing pieces, Clerk's naval game evaluating damage effects, and Yoshisuke's political business games were all sources of innovation but outside conventional boundaries. Current game designers are exploring new threat vectors including the rise of the non-nation state actors.

The temptation of governments and military establishments is to seek wargame innovation from within. Dr. Stephen Downes-Martin, fellow at the US Navy War College has written on the problems of self-generating innovation. Downes-Martin believes an important key to innovation is risk taking. He believes that innovation is difficult if the participants are not at risk by the process. Downes-Martin wrote "Breaking the rules of conventional wisdom and doctrine is incredibly hard for people to do when their lives (or careers) are not at real risk." (Downes-Martin, 2015)

Another problem is establishing fixed guidelines for the evaluation of problems and limiting solution sets for solving them. As these parameters remain fixed the problem is evolving. In the past 30 years one exception has been the British Ministry of Defense and specifically the British Army that looks to the outside for fresh ideas and innovation.

This has culminated in the 2017 British Ministry of Defense Wargaming Handbook. This handbook was primarily the work of British wargame expert Graham Longley-Brown. Additional work to further upgrade the handbook involves Professor John Curry (Ministry of Defense, 2017).

Summary

Wargames have proven their value throughout their long history. Studying this history provides a basis for accurately evaluating potential opportunities to employ wargames. The future of wargames will require a variety of game applications from role playing to manual board games to computer games. Each offers strengths and limitations. Dr. Peter Perla and Dr. Ed McGrady have analyzed what makes wargames work. They stated:

Wargames are synthetic experiences; to make the most of them, we need to integrate them with all other tools (analysis, exercises, History, real-world experience) that we have available to help us make sense of what we can and should do in the present and future. (Perla & McGrady, 2011)

Having an accurate understanding of what a tool can do gives the workman the best chance of optimizing its employment. Understanding wargames allows us to ignore the myths and focus on the possibilities for research, analysis, and decision making.

Can wargames make difference as public and private decision makers contemplate the future? I believe they can be very valuable if we recognize their limitations and critically evaluate their outcomes.

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