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WARGAMING HANDBOOK

Conduct a Wargaming Project

CICDE

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WARGAMING HANDBOOK

Conduct a Wargaming Project

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PREFACE

Wargaming is a proven tool that facilitates questioning, debate and the exploration of alternatives in a time when the nature of war is constantly evolving. It also offers decision-making experience to enable future leaders and current decision-makers to exchange views within a controlled framework. It is a complementary tool that does not serve predictive purposes, but enables qualitative - and sometimes quantitative - analysis of the actions taken by players and their consequences. It is a tool to test prospective crisis situations and contribute to our collective preparedness.

I wanted to develop a multifaceted wargaming tool so that its uses, potential and limits could be explored, known and taken into account faster and wider than today. This impetus has been translated into action by CICDE (Joint-Army Center for Concepts, Doctrine and Experiments). With this handbook, we hope to spread the culture of wargaming within our institution. This document provides a guide for developing these projects, which are highly iterative in nature and encourage cooperative design.

I invite you to take hold of its contents, to try out this practice for yourself, test your own approaches and publicise your initiatives, projects and achievements to the CICDE, which leads the joint-army wargaming function.

Au-delà de la mise en œuvre de l'outil, le wargaming offre un moment fort d'intelligence collective, de cohésion et de connaissance de soi et des autres.

Général d'armée aérienne Eric Autellet
Vice Chief of Staff
August 2023

« Beyond the implementation of the tool, wargaming offers a strong momentum for collective intelligence, cohesion, self-awareness and knowledge of the others. »

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PLAYER B
OPERATION ACTIVISME

EXECUTIVE SUMMARY

Numerous books exist on wargame design. This handbook has a general intent and a specific objective: the development of wargaming culture, and the creation of a guide for the realisation of wargame projects. It has been written by representatives of the Armed Forces Directorates and Services, under the direction of the CICDE with the Center for Doctrine and Command Education (CDEC), Defence Innovation Agency (AID) and the Center for Technical-Operational Defence Analysis (CATOD).

Wargaming is a powerful tool, among other tools for analysis, training and personal development. Through its variety of forms and uses, it helps to better understand the parameters of a crisis, to test a doctrinal or anticipatory position paper, gain decision-making experience, or get to know each other better collectively with a particular level of immersion and develop collective intelligence. Wargaming is at the service of strategic thinking, and hence, it encourages and raises questions that might not have arisen otherwise. It offers a time for thinking in an environment where mistakes have no consequence (fail to save environment). Wargames are adjusted to be integrated into large-scale exercises, as a privileged space for reflection and adjustment.

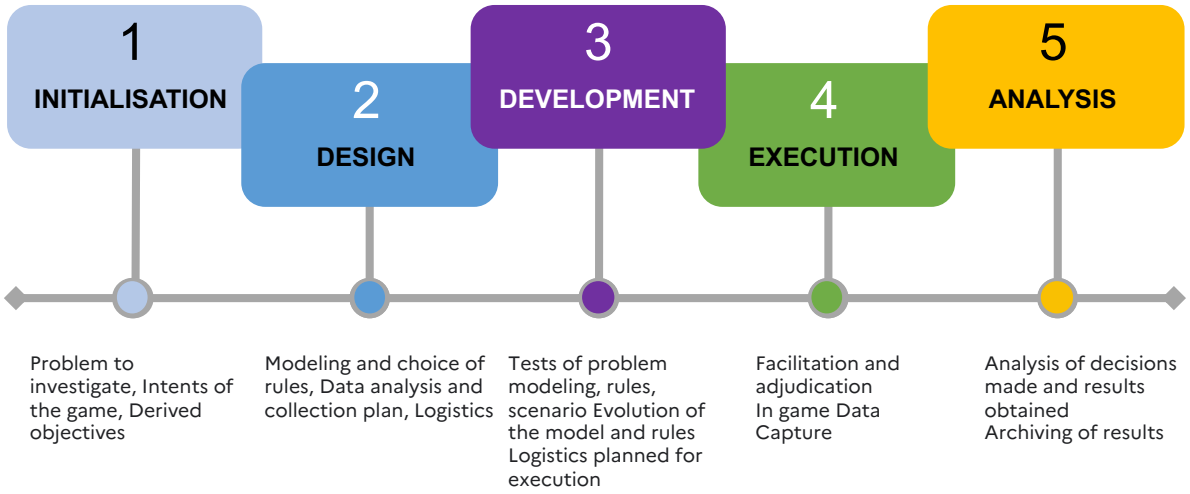
What a wargame is not? A forecasting tool, a realistic and quantitative simulation, a tool for finding all the solutions to a problem, or a device able to reproduce the same results. It is not a substitute for Comprehensive Operations Planning Directive (COPD). Its nature is a simplified and plausible model of a given problem that answers one or two questions that the game's sponsor wishes to explore. A wargame is also an instrument of influence and communication, although this matter is not developed in this document.

The various forms of wargames can be combined to better adapt to demand. From role-playing games with minimal rules to digital remote games with complex rules, and projects that combine manual games and digital tools. These games have been constantly evolving for almost 200 years.

Broadly speaking, a wargame serves one of three purposes: analytical, educational or experiential. To meet these objectives, several types of games are available, which can sometimes be combined:

Purpose	Type of Game
Analytical to test a concept or doctrine in support of operational planning.	Simulations with a rigid rules mechanism (i.e., no arbitration necessary), generally based on algorithms and the use of the most realistic data possible.
Educational for general or specific learning, training and education, discovering crisis situations..	Games with rigid or semi-rigid rules that take the form of a board game, computer application or any hybrid form between the two. An arbitration and/or facilitation is required.
Experiential to experiment with decision-making, cooperation between players and team building.	Dialectical role-play, matrix games or seminar games with semi-rigid or totally subjected to discussion (minimalist rules). Facilitation is required.

A **recommended method to create a wargame**, from design to after-action analysis, is summarised in five steps below :



This document describes the full range of desirable skills to support the making of a wargame project. At a minimum, beyond the game's sponsor there must be a project team, a game and scenario designer, a facilitator, graphic design skills, computer development skills (if the game is digital), an observer or analyst, and player-testers. In practice, several functions are combined within the same design and operation resources.

The most **common difficulties** encountered in the development of a wargame project are:

- The sponsor pursues several objectives at once, or changes their mind regularly after the guidelines have been defined.
- The sponsor expects quantitative and reproducible solutions to help solve the problem.
- The required data to make the scenario plausible are not available.
- Project team members are insufficiently available and the observer/analyst component is missing.
- The game design does not strike the right balance between realism and playability.
- Players are insufficiently prepared and/or unwilling to be in a playful posture (a form of personal risk-taking).
- The conditions in which players are welcomed and the execution of the game are mediocre, which is significantly detrimental to the experience.

In conclusion, the use of the “wargame” tool, particularly in its manual or hybrid form (manual and digital), at a lower cost (production and deployment), enables the development of adversarial debate and an opportunity to practise decision-making on the simplified model of a complex issue. The method described here for producing a wargame project is proven. The critical element remains the human resources to design, facilitate and analyse the results. Readers are encouraged to develop their skills in this area, share their experience with the wargame community and spread the word about the advantages and limitations of wargaming.

CHAPTER 1
WHAT IS A WARGAME ?

« It is not just a game. It is a training for war! This practice must be recommended to the whole army! »,

Marshal von Müffling,
Chief of Staff of the Prussian Army, 1824

I. ORIGINS AND CURRENT STATUS OF WARGAMING

Wargames present the paradox of being both an old and a new phenomenon that is rapidly expanding. Since ancient times, armies have sought to represent and model combat for the purposes of training, reflection and innovation.

From the 6th century, the *Chaturanga* (or "Four-Division Game") appeared in India, which offers a fairly rudimentary presentation of the battlefield, with troops representing the four classic arms of Indian armies at the time: infantry, cavalry, elephants and chariots. This game is the ancestor of modern chess..

After the defeat of the Prussian army in 1806, there was an urgent need to reform for more efficiency, innovation and collective intelligence, leading to the success of the *Kriegsspiel*, created by two Prussian officers, father and son: the Counts von Reisswitz. The two designers succeeded in demonstrating the value of a realistic and accessible simulation that relies on an existing database of firearms' lethality. These first forms of *Kriegsspiel* captured the attention of the Chief of High Command of the Prussian Army Marshal von Müffling. After taking part in a game in 1824, he exclaimed "*it is not just a game. It is a training for war!*". There followed an injunction to make this practice mandatory operational training for all staff in the Prussian armies in the following years. Prussia's operational successes in the second half of the 19th century prompted many Western armies to draw inspiration from this tool for training and operational preparation of their armies. In France, the defeat of the 1870 war led to the wake of military reforms and the creation of the *École de Guerre*. In this context, a wargame, translated from a German game developed by Meckel, was published in 1876 and met with mixed success. In the US, the impetus for the use of wargames came primarily from the Navy's rise to power. At the beginning of the 20th century, wargames were integrated into school curricula and continue to do so. Through regular, methodical and open practice of wargames, particularly at the tactical level, the US Naval War College identified a large number of difficulties and provided solutions in areas as diverse as logistics and protection. Admiral Nimitz, winner of the Pacific War, declared in 1961: "*The war with Japan had been re-enacted in the game rooms here by so many people and in so many different ways, that nothing that happened during*

the war was a surprise —absolutely nothing except the kamikaze tactics towards the end of the war; we had not visualized those. For the rest, everything went pretty much as we'd imagined".

Although not a basis for prediction, the wargame successfully established itself as a useful tool for implementing the reforms that became necessary in the face of strategic and operational developments.

> *"... Wargame is a tool for exploring and informing human decision-making.[1].*
>
> James Markley, 2015

For the last two decades, the development of several game models of conflicts, particularly asymmetric ones, have enabled the military —and sometimes political decision-makers -- to experiment with different approaches or to gain a better understanding of the long-term dynamics of these crises.

As these conflicts generate numerous uncertainties, their modeling enabled testing of a variety of models, taking into account not only military components, but also factors linked to populations' behaviour, the impact of non-governmental organisations, as well as emerging or hijacked technologies

Today, France, the EU and NATO member states face challenges in new environments characterised by significant instability, facing potential adversaries with capabilities of the same type and the same technological level, or even superior in certain segments. The hypothesis of high-intensity engagements and hybrid conflicts, mobilising all the nation's forces, is an important reason for the revival of wargames in Western nations, and particularly within NATO[2].

Whatever the type of crisis, or its variants and combinations (whether sporadic, asymmetrical or high-intensity), wargames provide the means to examine, test and verify strategic, operational and tactical approaches.

The conduct of experiential wargames as part of training offers a more concrete, pedagogical and effective dimension to the learning of concepts and doctrine. One of the essential virtues of wargames is to allow, in an educational way, and with a few inexpensive resources, to experiment with the application of these doctrines.

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[1] Markley, J., (writer and editor)., Strategic series Wargaming: Manuel, Strategic Wargaming Division, US Army War College (USAWC), July 2015, p. 1.
[2] Strategic Vision of French Chief of Staff, Général d'Armée Thierry Burkhard, octobre 2021

II. DEFINITION OF CONTEMPORARY WARGAMING

The NATO definition of wargaming is taken from the NATO Wargaming Handbook (2023):

Wargames are representations of conflict or competition in a safe-to-fail environment, in which people make decisions and respond to the consequences of those decisions

This definition contains three elements essential to all wargames, whatever their objective:

- Players make decisions.
- These decisions are motivated and influenced by situations of friction, competition or confrontation.
- Players receive feedback on the consequences of their decisions, which impact subsequent decision-making.

2.1. Players make decisions

Wargames are essentially based on decisions made by players[3]. Players must be able to choose how to respond to the friction introduced by the game. There is sometimes confusion between “command exercises” (or “command post exercise”) and wargames. In the first case, participants are evaluated on how well they demonstrate their understanding of doctrine and apply staff procedures. But with wargames, players are encouraged to make decisions and react in different ways. It should be emphasised that decisions must be made by human players. If some or all of the decisions are made by an automated system, then this is a computer-assisted analysis. The use of automata and/or artificial intelligence as a player is possible. Beyond the tools, it is the nature of the interactions that defines a game as a wargame. The contribution of digital tools and the hybridisation of man/machine are generally more effective when used together as part of analytical campaigns or broader training initiatives.

[3] Players are assumed to be human, although they may be supplemented, or one of them replaced by, an automaton or, to some extent, an algorithm based on artificial intelligence technology.

Player decision-making is the most important factor in any wargame

2.2. Friction as a critical element

Friction is a critical element of wargames, and takes the form of competition, contestation and confrontation. There are several ways of introducing friction:

- **Players or Red Cell**: an active opponent, embodied by the players or a non-player team, acting to achieve their own objectives, despite the actions of other players.
- **Injections of scripted or random events**[4]: these can be positive or negative events for players, in addition to the friction introduced by players' own actions.
- **Competition for scarce resources**: the game makes players compete for scarce resources, such as strategic locations on the map, funding or public opinion, depending on the context of the game.
- **Negotiations**: the creation of compromises between players leads to useful information and analysis for the course of the game.
- **Incomplete or contradictory information**: it encourages players to make decisions with imperfect information, which easily introduces friction.
- **Introducing a new idea, concept or skill**: introducing elements to which players have never been exposed is another method that stimulates adaptation, especially if the introduction is a surprise.
- **Combinations of all the above**: combinations of the above-mentioned elements are quite common, at the cost of increased complexity for players.

2.3. Adjudication takes different shapes

The aim is to provide feedback to players on their decisions. Adjudication may be performed in different ways:

- **Referee**: the easiest form is to ask one person or a group to examine the actions of all players and issue a judgement to the players. This can be done by wargaming experts, or people with experience in similar scenarios. Adjudication is generally assisted by manual or computerised resolutions.

[4] Based on the “MEL/MIL” principle: Main Events List, Main Incidents List, a table of scripted events and incidents, possibly supported by computerised information management tools.

- **Consensus**: a form of refereeing self-management that allows players to discuss their actions and reach a consensus on the likely outcomes. This can be facilitated by a moderator and can include simple probability checks.
- **Automated script-based adjudication**: adjudication that uses predetermined rules to judge player actions. For instance: if player X does action Y, then the result is Z. Most commercial board games and wargames work on the basis of these rigid rules, leaving as little room as possible for rule interpretation. An element of randomness can be introduced to limit the determinism of results.

Whatever the method used for adjudication, capturing the reasoning leading to the results is valuable during and at the end of each game session.

2.4. **Failure for positive purposes**

Wargame provides an environment that encourages decision-making without fear of judgement or evaluation. This principle is essential for the players to make the best decisions possible during the game session. In the context of the wargame's execution, it is all about accepting failure for positive purposes to facilitate critical questioning and the emergence of new strategies that help solve the problem posed by the game.

2.5. **Wargames create collective narratives**

A wargame scenario enables players and the session leaders —through a series of actions and interactions -- to write a story together. This narrative is valuable to the wargame sponsor, as it expresses the players' points of view and the new ideas that may emerge during the session. It is important that the players feel involved and that the game session is conducted avoiding digressions unrelated to the objectives of the wargame. As mentioned in Chapter 4 (design and development), the scenario should provide enough information to keep players engaged and feel informed, but not so much that it overwhelms them with the objective of the game session.

III. COMPONENTS OF A WARGAME

The definition of a wargame also implies essential environmental elements for its positive exploitation:

- **An Intent and Objectives for the game** (educational, research, analysis, demonstration, operational preparation, etc.), identifying the nature of the question to be answered, for which the wargaming tool seems relevant and fits in with other tools**.**

- **An environment and scenario** that will enable players to enter into a plausible concrete situation.
- **Players** who are willing to play, who are consistent in their decisions and who interact according to the consequences of their decisions on the evolution of the scenario.
- **A modeling mechanism** (not to be confused with a simulator) used to represent simulated time, the effects of combat in its different dimensions, information management and degree of uncertainty.
- **Rules to manage the game**, the evolution of the scenario and the interaction between players and game components. Simplicity and credibility of the rules should be pursued.
- **A design, development, facilitation/adjudication and analysis team**. The credibility of the refereeing method is essential to ensure that the results of the game are accepted by the players and by the sponsor.

CHAPTER 2
WHAT USES FOR WARGAMING?

« Tell me and I forget. Teach me and I remember.
Involve me and I learn »

Liu Xiang (in Xunzi) or Benjamin Franklin or Chinese proverb…

I. PURPOSES AND TYPES OF WARGAMES

Most wargames serve one of **three purposes**: analytical, educational or experiential.

- **Analytical**: to test a concept, a doctrine or a system, in support of operational planning.
- **Educational**: for general or specific training, apprenticeship, or to discover the dynamics of a crisis situation.
- **Experiential**: for experimenting with decision-making or cooperative team-building.

Whatever the purpose, the ultimate aim is to draw lessons from the decision-making and interactions between players. The realisation of the wargame project is similar for all three purposes.

- **Analytical wargames**: they seek to enlighten the game's sponsor on their question. A game that examines a plan, concept, doctrine, strategy, prospective position note, or course of action (COA) is an analytical wargame. These games require a data collection and analysis plan (see below, chapter 3, step 5) and, more generally, an after-action analysis process

Analytical wargames provide decision-making information.
They inform the decision-maker
by learning from players' decision

- **Educational wargames**: they aim to educate the player about a particular theme, such as a regional crisis, or the opportunities and difficulties of multi-domain operations (MDO). These games are used for training and practice. They aim to draw lessons from the analysis of decisions taken, and to master the subjects covered by the game. Generally speaking, the analysis

of these games will be simpler and will focus on the game's ability to raise the skill and knowledge levels of both individual player and the group. They also bring experience to players, which make them similar to experiential wargames.

Educational wargames produce knowledge and contribute to improving individual and collective learning by the players' decision

- **Experiential wargames**: they aim to provide players with both personal and collective experience, with predefined roles in an environment that approximates the real-life settings in which these roles are played. These games are particularly useful for preparing players for decision-making, cooperation and, more generally, the discovery or deepening of a latent or open crisis environment. They are similar to educational games, but they are not aimed at evaluating players.

Experiential wargames produce an experience in decision-making and cooperation

To meet these objectives, several **types** of game exist and can be combined:

- **The seminar and « *Brain Games* »[5] format** : a free discussion, albeit often scripted, in which participants are experts on the subject. They take turns expressing their actions or point of view on a question posed in advance. This format allows open discussion to elicit opinions and judgments. The role of the referee is minimal. This format is suitable for being implemented very quickly, at the strategic level, in order to highlight issues, comment on a position paper, or explore questions in greater depth.
  - *Advantages*: easy to set up, usually played in small groups, can be used to prepare a Matrix Game (see below).
  - *Disadvantages*: requires a facilitator, may limit player interaction between players, does not manage actions realistically within the allotted game time.
  - *Typical purpose:* educational or experiential.

[5] Institutionalised within the French Joint Staff for the Chief of Staff.

- **The "Matrix Game" format:** in this type of game, players develop arguments justifying the actions they intend to take to achieve their objectives and the consequences of their decisions. More structured than seminar games, but with very simple rules and a referee, they encourage constructive dialogue on complex subjects. They bring into play the interactions between the different levers present in modelling the situation. They are well-suited for the purposes of acculturation, discovery of a regional crisis[6] or influence. However, they are generally poorly suited to the study of confrontations at the operational and tactical levels requiring rules detailing the complexity of engagements at these levels.

    - *Advantages:* easy to teach (few rules), inexpensive to develop, extremely flexible in terms of the scenarios played; creates narrative.
    - *Disadvantages*: requires strong facilitation, can be frustrating for players who expect more structure / less subjectivity.
    - *Typical purpose*: educational or experiential.

Seminar and Matrix Game formats are particularly suitable for fairly short sessions, half a day or less, with decision-makers. Their speed of production means you can react quickly to the sponsor's request

- **The "rigid rules" format**: sometimes mistakenly called only Kriegsspiel in reference to the historical wargame model (see Chapter 1), these games confront the players with a more or less complex system for resolving and limiting their actions[7]. They do not always require a moderator or referee. They combine a fairly faithful representation of the terrain, favouring the realistic and immersive character of the game, and the possibility of introducing events. They are well-suited to the representation of battles and

[6] For example, the CICDE-revised version of the game High North or Flashpoint: Baltic (geostrategic stakes for NATO), played by high-ranking authorities at the Wargaming Initiative in NATO in Paris (2022), Rome (2023), ACT Norfolk (2023) etc.

[7] Like "Duel Tactique" (École de Guerre Terre) used for training or "Décision Défense" (DSNJ) shown to the French Universal National Service.

historical campaigns (study of military history, in addition to sequences of historical field study[8]), for doctrinal exploration[9] or for the study of capability and prospective concepts[10]. These games can take the form of tabletop/board games or digital games (although they are not simulations).

- *Advantages*: enables friction between players/units to be visualised and fine-tuned, game duration can vary from less than an hour to a day.
- *Disadvantages:* requires mastery of the rules, potentially expensive if digital and less flexible (maintenance / evolution of the rules engine).
- *Typical purpose*: educational or analytical.

Most commercial wargames (board games and video games) have rigid rules. They can serve as an introduction to the professional use of wargames and provide an excellent basis for the design of specific game mechanisms, or their design can be repeated in full, for professional projects.

- **The "support for technical-operational studies" format**: this type of game aims to ensure that an operational capability, usually innovative, is consistent with a complete operational environment, its concepts and possible doctrines of use or experimentation. These games can be hybrid, with a digital simulation on the one hand, and a manual (or digital) environment on the other hand, relying on players' free decisions. The CATOD is more directly involved in this type of game, as is the AID for the integration of emerging technologies. This format can be used as part of the validation process for integration of an operational capability into a device.
  - *Advantages*: precise results with qualified and more realistic data.
  - *Disadvantages:* costly if existing components cannot be reused.
  - *Typical purpose*: analytical.

[8] Or staff rides, involving the study of historical campaigns and battles, combining theoretical and practical study on the actual battlefield, as practiced by the Ecole de Guerre.
[9] Like the wargames played at the CDEC as part of the SCORPION Combat Laboratory.
[10] Based on the model of capability study wargames of EMA and DGA/CATOD.

"*We know that games can make meaning because some games change us when we play them. A trace of the experience lingers after the game is over – a new idea, a new emotion, a new way of understanding the world, a new way of understanding ourselves. We're different people than we were before we encountered them".*

Brian Upton, 2018, The Aesthetic of Play

II. ADDED VALUE AND LIMITATIONS

"Wargaming offers unique perspectives and insights that complement other forms of analysis or training. It enables us to examine, replicate and develop an understanding of decision-making in complex contexts when faced with a determined and dynamic opponent. Indeed, it is often the only way to explore 'wicked' problems. Wargaming enables users to integrate different methods, tools and techniques (quantitative and qualitative) with a human element, thereby creating a capability that is greater than the sum of its parts"

Wargaming Handbook, DCDC (UK) 2017

2.1. The added-value of using wargames

- The ability to explore options and take risks at the lowest possible cost in terms of resources of all kinds (human, technical, financial, etc.)
- The development of collective intelligence within the framework of the military staff, by optimising dialogue between the command and staff levels, thus fostering the development of command by intention (in the NATO Mission Command sense) and subsidiarity through increased mutual understanding between leaders and subordinates.
- The shared understanding of a situation and a doctrine/concept, the knowledge/appropriation of the geographical area, the interplay of one or more forces in the context of operational readiness.
- A concrete way to acculturate participants to risk-taking (learning by "trial and error") and uncertainty, even when facing reactive opponents who use every means possible —including not the same rules -- to achieve their objectives.
- A way of illustrating the essential elements of the use of military tools, particularly in the context of defence training.

2.2. Limits and Constraints on the Use of Wargames

- **Non-predictability of results**: a wargame session produces a plausible narrative, but it does not predict immediately usable results. In other words, wargames do not generate the solution to the problem posed at the end of the game. Yet, they can generate new questions and avenues that can lead to plausible conclusions through further analysis.
- **Non-reproducibility of results**: a wargame is essentially based on human decision-making. In analytical studies, the ability to reproduce results is important for their validation, but the unpredictability of wargames, linked both to the dialectic of opposing wills and random factors, favours the

emergence of new idea, as the starting point for new analyses to answer the question posed.

- **Producing qualitative results**: a wargame produces results that essentially contain a succession of decisions based on interactions between players and with the referee on the one hand, and the interpretation of imperfect data on the other hand. Nevertheless, used in conjunction with in-game data capture or in combination with simulation tools, wargames can contribute to quantitative results.
- **Wargames are as much about the quality of the modelling of the problem as the interventions and relevance of the players' decisions**: participants in wargames, especially analytical wargames, must be skilled and knowledgeable in their designated areas of expertise.
- **The practice of wargames must be considered as a tool in a broader analysis or training process**, except for the acculturation of an audience to the use of this tool in a training situation, and should not be used as an end in itself.

To sum up, the advantages and limitations of wargames are as follow:

Advantages	Limitations
Provide a model where players can make decisions and use new approaches to solve difficult problems. Games can be played more than once.	Wargames can be played several times, but the results cannot be reproduced identically. They are not predictive and not very quantitative.
Having a relatively economical way to practise decision-making and crisis management skills.	The lowest cost in terms of expertise and production costs requires a minimum of in-house talent and a facilitated purchasing procedure for the production or purchase of external skills.
Facilitating players' exposure to friction and uncertainty, including adversity that adapts to changing circumstances, competitors, allies and stakeholders.	Wargames can complement, but not replace, more rigorous or detailed analysis.
Discovering new factors or interdependencies between factors and asking new questions (“ Known Unknows” and “Unknown Unknowns”).	Wargames require the “right” participants available with an open mind, ready to be potentially surprised.

III. FIELDS RELATED TO WARGAMES

3.1. Computer Simulation

Often confused in everyday language, simulation and wargaming are related, but not identical.

However, where simulation seeks to approximate as closely as possible the physical reality of a system, wargaming focuses on modeling the effects of players' decisions, accepting a degree of abstraction and in strict coherence with the objectives defined for the game.

Nevertheless, many wargames rely on simulation to generate a plausible situation (and analysis data) encouraging players to make decisions, or to assist in game facilitation and adjudication.

3.2. Red Teaming or “critical thinking exercise”

Red Teaming can be defined as a function aimed at providing the alternative analyses of plans, concepts, organisations or capabilities in an operational environment through the use and mastery of critical analysis and creativity.

Thus, the implementation of wargaming implies a methodology which is not limited to the sole involvement of a Red Team.

Hence, Red Teaming should not be confused with the intelligence expertise necessary to define the environment, scenario and analysis of a wargame, nor with the initiative Red Team Defence of the AID, which aims to use the creativity of authors to imagine future conflict scenarios based on emerging technologies.

"*You cannot solve a problem*
with the same mind that created it"

Albert Einstein

Red Teaming is the work carried out by an ad hoc team, trained in specific techniques, most often derived from group psychology or sociology. In any case, the objective is to approach situations using a range of tools, which is different from the traditional military decision-making processes. Not that these tools are irrelevant, but using the same tools as the rest of the Armed Forces Staff significantly increases the risk of generating the same solutions, and thus, of challenging the very nature of Red Team's effectiveness. It is therefore counterproductive to improvise a Red Teaming session at the risk of simply "ticking the box" without producing the means to improve the collective decision.

Red Teaming should not be confused with the role played by the Red Cell, playing the role of a reactive adversary in a wargame. The role of Red Teaming is primarily to identify biases of any kind that distort the logical approach to planning and conducting operations. In this respect, Red Teaming differs from wargaming. On the other hand, wargames and Red Teaming use similar underlying concepts, such as contradiction and difference of viewpoints, to improve the decisions taken.

Wargaming and Red Teaming are therefore complementary yet distinct approaches, both aiming to improve the relevance of decision-making in a dynamic conflict environment.

3.3. **Concept Development and Experimentation**

The methodology of developing concepts and experimentations (CD&E, Concept Development & Experimentation), as defined by NATO, is the tool for structuring creative and innovative ideas into operationally viable solutions.

This methodology aims to streamline the development of operational concepts, particularly in the area of capabilities, either as part of a specific development campaign, or as part of staff exercises (Command Post Exercises).

Experimenting with an emerging concept can use tools, such as analytical wargames, in the analytical stage. This is also the case in a broader context, with other methods such as operational analysis.

The wargame allows a concept to be subjected to critical analysis, and not validation through a scenario. Nevertheless, by its very nature, a wargame is based on the interaction of human decisions, and the results are not reproducible. This is why other methods, such as operational analysis and the use of simulation tools based on the same initial data, will be necessary to validate a concept.

Source : Rapid VR Decision (Manzavision, ESTIA, Immersalis), 2023

CHAPTER 3
WARGAME FUNDAMENTALS

"Strategy is the art of the dialectic of forces or, more precisely, the art of the dialectic of wills using force to resolve their conflict"

Général Beaufre, Introduction à la stratégie, 1972.

Three key elements contribute to the effectiveness, relevance, and success of a wargame. Taking them into account in any wargame project is an essential condition for its success:(i) the dialectic of wills, (ii) the balance between the "artistic" part and the "scientific" part of the wargame, and (iii) the role of uncertainty and chance in the calculations made in war operations.

I. DIALECTIC OF WILLS

A wargame is an incomplete and imperfect model of reality. Nevertheless, to qualify as a wargame, the system put in place, whatever its form and the object of the study it supports, must always meet the requirement of being based on the opposition of the wills and means of at least two players or groups of players.

This is what fundamentally differentiates wargames from serious games11 The dynamics of a wargame are based on the dialectic of wills and the attempt by each of the adversaries to impose that will on the other, using the means that are specific to armed forces.

The modelling of this duel of minds is achieved by a cycle of actions/reactions and anticipations of reciprocal actions. This is a major added value of this tool which leads the players to base their decision-making dialectically and think simultaneously about the manoeuvre of the different factions involved. Without the use of real armed forces, the wargame creates an environment in which the course of events affects and is affected by the decisions taken by the players. It also enables the entire project team to analyse a situation by understanding the points of view of all players at the end of the different game phases.

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[11] See the non-profit organisation Serious Games Network France www.seriousgamesnetwork.fr, organizer of the first large-scale Professional Serious Games and Wargames Events in 2018 and 2020.

Above all, it enables players to develop their ability to design, plan, conduct and analyse military operations using a tool that does not punish mistakes but uses them to highlight the mechanisms of confrontation. It avoids the risk of exercises involving an opponent with no real will of their own and a predictable behaviour.

The primary effect of military action, beyond the simple tactical gesture, is the result of a dialectic of wills, intentions and means.

II. ART AND SCIENCE IN WARGAMES

A wargame that aims to model war activity must preserve its general principles. Among these, the science/art duality is important.

A wargame is first and foremost an imperfect representation of reality, with a degree of abstraction that aims to analyse the relative proportions of the "artistic" part (which comes down to talent, the ability to create a work) and the "scientific" part (which comes down to rational knowledge).

Although unpredictable, war is both an art and a science in its conception, planning and execution. The artistic part refers to the intuition, creativity and even imagination of the strategist or tactician.

Strategy and tactics can therefore be seen as speculative arts based on prior knowledge and understanding that do not provide a preconceived solution to every situation. This is an application of the famous "*What's it all about?*" question asked by the Prussian general Verdy du Vernois[12] in Gitschin,1866, and later taken up by Marshal Foch. The first to arrive on a battlefield with an unfolding complex situation will have to find a solution, which history or theory alone cannot provide. Marshal Foch said: "*In war, you do what you can with what you know; to be able to do little, you need to know a lot*".

Therefore, the aim of a wargame is to improve the players' knowledge and skills by providing them with all the information they need to design, plan, and conduct a military operation. It should also enable participants to improve their ability to ask questions and come up with possible solutions to the problem posed by the game.

Finally, a wargame is a way of assessing the acquired knowledge and realising the difficulties involved in applying doctrines, theories and practices that might

[12] General Verdy du Vernois wrote an « essay on the simplification of the wargame », translation of which was edited in 1877 in Brussels.

seem simple and straightforward in theory. In this respect, a wargame is a tool for practising and experimenting at low cost, without any real risk and therefore with very little moral and physical pressure, even in major engagements. The wargame can therefore be used to consolidate what has been learned, the "scientific part", while encouraging creativity, the "artistic part".

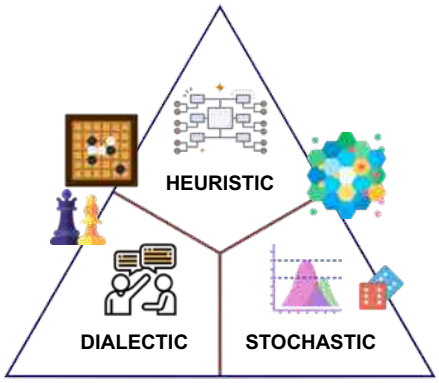
III. CALCULATION, UNCERTAINTY AND CHANCE

A wargame is situated in a zone of equilibrium between three elements which must be considered when constructing the system on which it is based.

The first is the dialectic, which we have already mentioned, representing the intellectual battle between the players, and enabling the wargame to come closer to the exercise of command in wartime.

The second is a heuristic method based on the uncertainty contained in realistic probabilities. A wargame is therefore based on data and statistics that cross several disciplines, not just military ones. The nature of war obliges the decision-maker to constantly calculate probabilities.

For Clausewitz, "*the objective nature of war makes it a matter of assessing probabilities. Only one more element is needed to make war a gamble--chance: the very last thing that war lacks. No other human activity is so continuously or universally bound up with chance*." He goes on to point out that: *"...there is no human affair so constantly and generally in connection with chance as War. And with chance, unpredictability plays a considerable part*"



In most wargames, a mechanism of uncertainty is introduced in various forms (rolling dice, random drawing of event cards, or their digitised representation). These mechanisms are sometimes perceived as breaching the serious nature of the wargames. These mechanisms are essential for two reasons. First, they help to consider the element of randomness -- and therefore risk -- or friction of all kinds that characterises any military engagement. Secondly, they help to maintain the dynamics of the game's narrative without leaving too much room for adjudication, which can be subject to cognitive, cultural or confirmation bias. Random mechanisms must nevertheless be strictly controlled and limited to the essentials to maintain the credibility of a game system. Otherwise, players risk losing their ability to influence the course of the game.

Finally, the third element is stochastic, which is used to represent the friction of war actions. Two identical situations will not produce the same result. The friction can be of very different natures: natural phenomena, erroneous formulation, or application of orders, and so on.

To conclude, the fundamental principle at the heart of the wargame lies in the people who make decisions and apply them in the context of conflict while being prey to uncertainty. The wargame enables us to understand the phenomenon of “war” through the mechanisms of the dialectic of wills, friction, risk-taking in decision-making, the impact of chance... all of which cannot be done simply by reading texts, testimonies, reports, or doctrinal documents. Finally, it is necessary at this stage to point out that the main limitations of a wargame lie in its inability to portray certain fundamental and psychological aspects of combat and war in all its reality, such as fear, terror, physical fatigue, the death of combatants and non-combatants, etc.

CHAPTER 4
METHOD TO CREATE A WARGAME

"A good designer should help sponsors determine if a wargame is actually the best way to get the analysis they need. If the answer to every question is a wargame, wargames are probably being misused" [13].

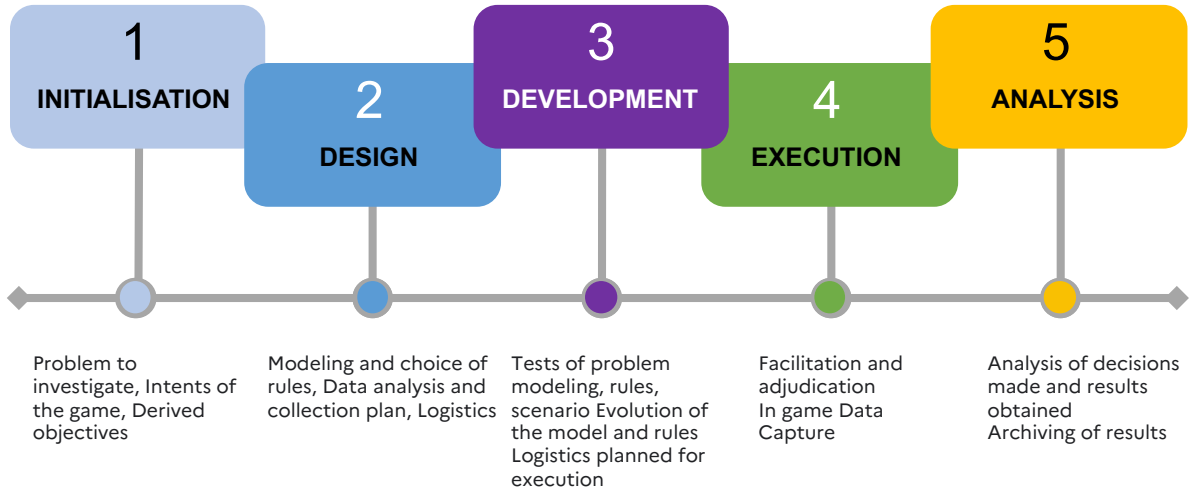
Elizabeth Bartels

I. PRODUCTION PROCESS

The volume and nature of resources (budget, human resources, deadlines) required to carry out a wargame project depend essentially on its purpose, the level of ambition and the type of wargame envisaged.

The project management model presented below is interoperable with the practices of allied armies.

The following method is adapted to the most demanding wargames. If you are using an existing wargame model, the design and development stages will be shortened. The testing stages are essential.



[13] War on the Rocks, Getting the most out of your wargame: practical advice for decision-makers, Nov. 19, 2019

1.1. General Presentation

There are **five steps** in a wargame project, which are detailed in the following sections:

- **Initialisation** : definition, with the game sponsor, of the objective(s), as well as the essential parameters (deadlines, resources, budget) for producing the wargame.
- **Design:** definition of the wargame's model and mechanisms.
- **Development**: fine-tuning and testing of the wargame mechanisms.
- **Execution:** running the game and role-playing of the players, with observation of player behaviour.
- **Analysis:** summary and evaluation of the results of the wargame. Although presented as the last stage, analysis must take place throughout the process to be as effective as possible.

It is important to consider the material management aspects of the event. This includes logistical support for the game session, ergonomics of the venue, safety, and material resources for the game. A well-designed game run in mediocre conditions, particularly in terms of player comfort, will generally fail to produce the expected results.

1.2. The Wargame Project Team

Depending on the level of ambition and the type of game envisaged, many roles described below are generally carried out by a variable number of people. For example, for a simple game, the project director is the game's designer, developer, and scriptwriter. They are also the referee and moderator (5 in 1). On the other hand, for more ambitious games, a role may be held by a team of several people (e.g., analysts or script designers).

- **Sponsor**: the authority behind the expression of the need for a wargame. It is involved in defining the desired product and approving each stage of the process. The sponsor is also generally responsible for the wargame's resources, although the organisation designing the game may also assume some of the resource responsibilities. It is recommended that the sponsoring authority appoints an officer, who is empowered to take decisions in monitoring the project. It is important that the appointed sponsor is of sufficient hierarchical authority to make important decisions about the project.

- **Project Director**: responsible for the overall wargame project and oversees the project team throughout the process. Typically, the Game Director will

lead interactions with the sponsor to ensure that the game meets the sponsor's requirements.

- **Game Designer**: responsible for the design of the game, working closely with the analyst(s), developer(s), script team and Project Director. It is important that the game designer has the necessary experience to model the problem and design a rules engine.

- **Game Developer**: their role is to refine and provide a critical eye on the design by developing the game rules. They help to organise game testing to ensure that the game is playable and takes account of the client's requirements. The developer must ensure that the game is suitable for players and act as a critical element for the designer.

- **Analyst**: their role is to provide feedback to the project team to ensure that the game will answer the research questions. For experiential games, the analyst position is not as important, but is still valuable in determining the value and impact of the wargame. For analytical wargames, it is desirable to have an analyst assigned to each team of players.

- **Scenario Designer**: Whatever the purpose of the game, the players play in the context of a scenario which forms the game's use case (a crisis, a plan to be tested, an organisation, etc.) Experts in specialist fields may be required.

- **Graphic Designer**: the first contact with a game, whether digital or manual, is through its appearance. The project team must have the necessary resources to produce the cartography and game elements (counters, event cards, game aids, etc.), which make a major contribution to the overall ergonomics and quality of the game's appearance.

- **Red Cell**: The red cell often acts as a player in many wargames. If not, then it must be involved in the development and definition of the scenario. Note that there is no obligation to choose the colour red, which is historical.

- **Players**: the game is designed for them, and the relevance of the game's results depends on their decisions and ideas. Players will generally be placed in teams, with each team having objectives to achieve.

- **Adjudicator or Referee** : Whatever the refereeing method chosen, a wargame will always need adjudicators, even if it is just to ensure that a digital refereeing tool or simulation is used correctly. The adjudicator(s) will ensure that the player's decisions are correctly judged and communicated to the other players.

- **Facilitators**: it is essential that the dynamics of the game follow both the players' proposals and the progress of the scenario if the game session is to achieve its objectives. The facilitators ensure that the scenario runs smoothly and on time and that the players understand the rules and carry out the tasks necessary for the game. A good practice is to have at least one facilitator per team, especially if the teams are physically separated.

- **Support Team**: this team provides technical assistance if specific technical resources are required (e.g., geomatic tools).

- **Observers:** it is good practice to involve observers during the game session, to take note of the behaviour of the players and the informal elements that contribute to their decisions.

- **Senior Experts:** they provide advice and expertise to the players on request but do not take part directly in the decisions.

II. INITIALISATION

When a sponsor asks the project manager to create a wargame, they provide an objective or problem for the game. Experience has shown that these are rarely a clear or sufficiently defined question at this initial stage. As with any project, the sponsor must also specify a budget limit, the available expert resources, and a deadline for completion of the project.

The first task of the wargame team is to work with the sponsor to ensure that they have a clear and shared understanding of the project goal and determine whether the wargame is the appropriate tool to meet the expressed need. If so, the wargame team, in collaboration with the sponsor, refines the problem statement and establishes the initial goal and objectives.

This first task is generally structured in two main stages, each with an associated deliverable:(i) an initial note of intent and (ii) a shared and validated scoping note.

2.1. Understand the Sponsor's Intents and Objectives

Deliverable: Initial Statement of Intent

The process begins with an intention formulated by the sponsor. A problem to be solved, learning to be reinforced, etc. The aim of the project team at this stage is to formulate its initial understanding of the intent and the associated objectives. If the sponsor has not yet formulated a clear intent, the scoping note that follows will initiate the alignment work with the project team to ensure that the wargame meets the sponsor's requirements.

Intent : this is the concise reason for producing the wargame. The wording of the intent also serves to strictly limit the elements that do not directly contribute to the wargaming techniques. A wargame must have a sufficiently restricted framework to avoid confusion.

Objectives : a small number of key issues called objectives are identified in line with the aim of the game. The objectives guide the design, analysis and topics covered in the scenario. Generally speaking, the number of objectives should be limited to three to maximise the coherence of the wargame and avoid a tendency to do too much in too little time.

If you have too many objectives (more than 3), add several phases to your wargame or create a new one.

Examples of problems, according to the three wargame objectives:

- **Analytical**
  We do not yet fully understand what planning hurdles we must build for the upcoming operation. We need to test certain aspects of a doctrine with personnel who are not familiar with it to improve this doctrine.
- **Educational**
  We need to check how well our trainees have integrated the principles of command and control into a complex operation. We need a tool that can be deployed quickly to teach the advantages and disadvantages of the logistical arrangements planned for zone A in the context of crisis B.
- **Experiential**
  We need help to understand the possible developments of crisis A and its impact on our forces in the area. We need the joint and interdepartmental team to get to know each other so that we can work better together in the context of operation A.

2.2. Reformulate the Intent and Objectives within the Project Team

Deliverable: scoping document shared with the sponsor and any other stakeholders.

This stage allows for a more in-depth dialogue with the sponsor. By defining concrete objectives for the game, any needs for clarification arising from the intent can be addressed. The project team and the sponsor can identify stakeholders for advice on this framework (experts in the field, other game designers, etc.) This scoping note does not describe the game, its model, or its rules, but focuses on the project mode.

An initial phase of study of the subject can be carried out in parallel to anticipate obstacles or opportunities in the design of the wargame, particularly regarding:

- **Game theme**: how credible is the model expected to be for the players? For complex subjects, this may require the help of experts in the fields in question.
- **Existing games**: which games can serve as inspiration? While taking account of the specificities of the sponsored game.

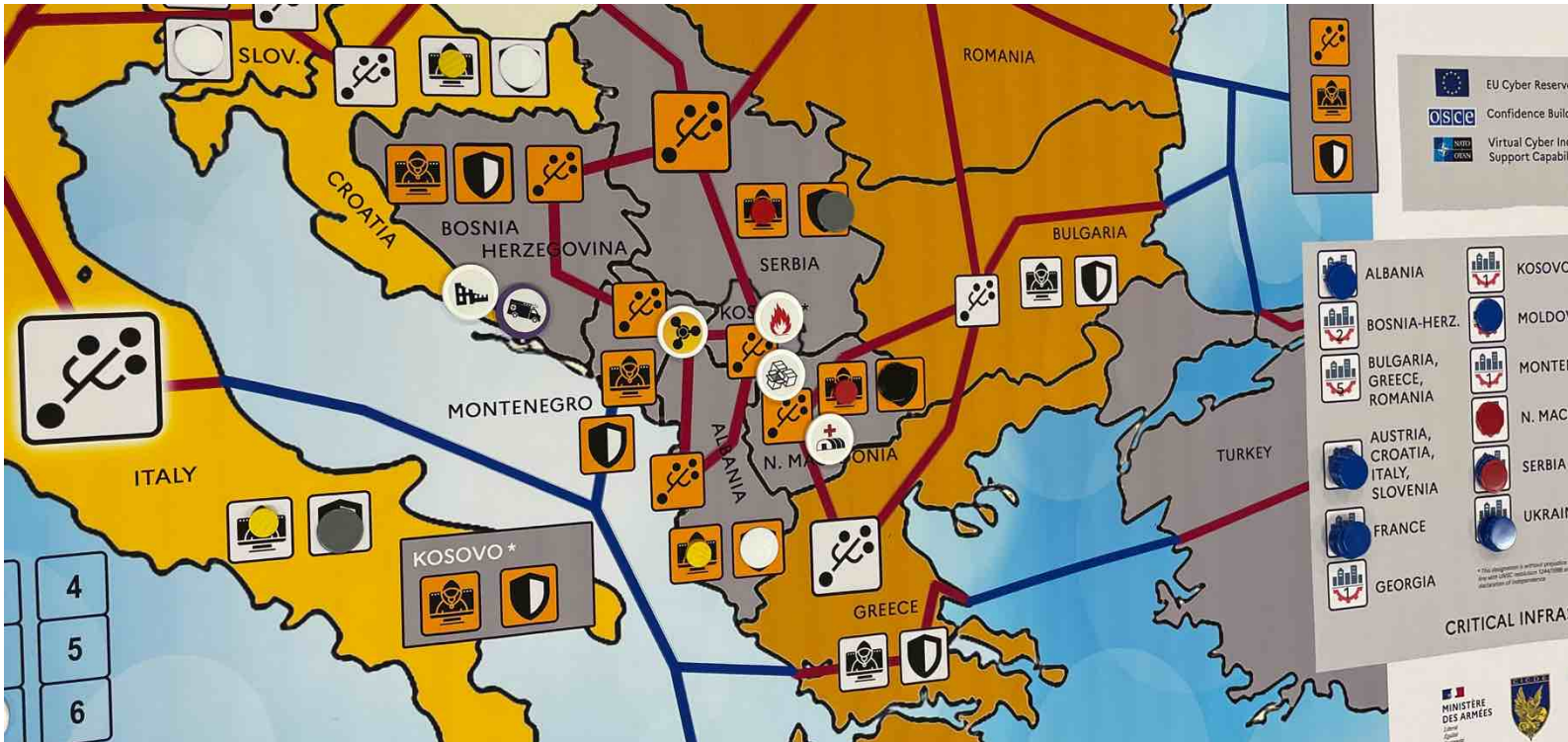
- **Forces involved**: what level of accuracy is required? The modeling of the forces present must be sufficiently credible to enable the participants to make decisions that make sense in terms of the sought objectives.
- **Level of classification**: what level of clearance is required to access the data, both for the players and the project team?

2.3. Clarify the Issues, Limitations and Opportunities of the Games

Deliverable: scoping document is approved by the sponsor.

This is the finalisation of the scoping document, which identifies the initial structuring elements for carrying out the project. Namely, human and technical resources, duration of the project, project monitoring committee (frequency, participants, etc.), data quality and access, desired criteria for evaluating the game and analysing the results, etc. Once the scoping note has been validated, you can move on to the design stage (design document).

Throughout the project, come back regularly to the initial framework and the purpose of the game.
The design process can easily lead you astray.



Example of translating an intent into an objective:

The intent is to assess the coherence of plans A and B in a multi-domain operation. This intent can be broken down into three objectives:

- Assess the alignment of effects and actions between fields.
- Assess operational gaps between plans A and B.
- Assess the ability of the operation's command and control to design, plan and conduct both plans simultaneously.

III. DESIGN

This is the start of the game design stage, based on the intents and objectives validated in the previous stage.

Deliverable: Game Design Document.

This is an iterative process by its very nature, which can be the subject of a formal document. It always answers the following questions:

- **How ?** The various wargame options and their respective advantages and disadvantages, which include:
  - The game format, which provides an initial idea of the type of wargame and how it will be adjudicated.
  - A draft scenario, including an initial assessment of the game's various elements.
  - A general outline of the game, including its duration and the distribution of teams.
  - A provisional timetable refined with the client (project milestones, decision points, project validation, etc.)
- **Who/With Whom?** A refinement of the list of stakeholders initiated in the scoping note (players, experts, liaison elements, observers) and an estimate of the total volume of personnel involved.
- **Where?** The main options concerning the venue where the game will be run, considering its accessibility, the modularity of the rooms, the availability of technical resources (video, IT), the ability to run the game according to its degree of confidentiality….

The project manager and designer conclude the design brief with their recommendations on the various options, their assessment of the project's ability to meet the defined objectives, and the requests to be made to the sponsor to continue the project.

These elements are subject to change during the game's development stage.

IV. DEVELOPMENT, TESTING AND VALIDATION

This is a highly iterative stage, in which we must regularly come back to the fundamentals formulated in the scope and design notes. Indeed, the risk of adding elements that ultimately deviate from the intention and objectives set must be considered throughout development. In addition, keeping in mind the speed and ease of implementation of the wargame should help to limit complexity during the development stage.

The development stage includes test stage during the design stage and a validation stage before the game goes into production.

Development includes the following elements:

- **Setting the game rules**. This involves questioning the relevance of each element of the game engine in terms of the balance between the simplicity of the rules and the results achieved through the gameplay, in line with the objective of the wargame. Here, the game developer interacts constantly with the designer and player-testers.

- **Adjusting the scenario**. This involves writing and adapting the scenario, including its cartographic components (physical or digital), to the main purpose of the game (analytical, educational, experiential). It can be done by creating events and incidents to be triggered during the game. The six modules detailed in the NATO directive[14] provide a good guideline (geostrategic situation, initial strategic political and military situation, initial crisis response, etc.). But be careful not to over-guide the wargame scenario. Players must have an influence, even if obligatory events and points of passage in the scenario are defined.

- **Choice of adjudication method**. The choice depends on the goal, as described in Chapter Two.

- **Determining the plan and means for analysing and capturing data during and after the game session.** The aim is to define and implement the means for exploiting the results and what led to their production by the players.

[14] NATO, Directive on Strategic Collective Training and Exercises 075-003, dated October 2, 2013, Appendix 1 to Annex M.

- **Determining game logistics.** Venue, player support, game aids, etc.

- **Preparing and conducting tests**: An essential step in fine-tuning the design and delivering a satisfactory wargame product that meets expectations. Particular attention must be paid to test preparation and the mobilisation of test players. Acceptance of criticism and humility in the face of design are necessary qualities during this stage.

V. EXECUTION

In this stage, the game session is effectively launched. Players face the consequences of their decisions and those of their opponents. They experience the activity of command and try to overcome the negative results of their decisions. Players get to know each other and develop a form of decision-making agility. This is what wargaming is all about.

The diversity of game sessions resulting from the combination of possible variants and contexts precludes a detailed explanation of how to execute them. Execution is a bespoke activity that varies considerably from one wargame to another.

It must be entrusted to a qualified and experienced team, supported as necessary by experts in the field(s) being dealt with. Tasks include:

- Carry out a rehearsal of the game session with test players, one to two weeks before the date of the game session.
- If necessary, train players and adjudicators/referees.
- Test the readability and simplicity of briefs for players and those for referees, analysts, and observers.
- Consider communication opportunities (audio-video recordings) and high-ranking visits.
- Capture data during the game: decisions, questions, behaviours, etc.
- Prepare a “hot-wash” with the players and the project team.

VI. ANALYSIS AND EVALUATION

"it is important to understand how wargames differ from other forms of analysis such as M&S [Modelling & Simulation] *and operations research/systems analysis, and to explore the inter-relationships and the complementary nature of the processes."*

Peter Perla, Wargaming and the Cycle of Research and Learning, Scandinavian Military Studies, Sept, 19th, 2022

It is about processing the information collected during the game session. The data are the decisions taken by the players, as well as the arguments (or any other kind of data) used to make them. This is not an operational research analysis report, in the sense of a search for optimal use of resources.

For analytical wargames, each game is unique and requires a robust and reproducible analysis process. Analytical games can be repeated to enrich the universe of data and information samples collected. Each set of results —and "why" those results occurred -- is different for a multitude of reasons. Any comparative analysis of results from multiple sets must clearly acknowledge and state these facts in reports to help readers avoid drawing the wrong conclusions.

In the context of a wargame —as opposed to a simulation-- the focus of the analysis is on the decisions taken by the players, the interactions between them and their relevance.

A major element of the after-action report is to collect the decisions that were made during the game, and primarily why they were made. The report looks at the situational context encountered in the game and how the circumstances influenced the players' decision-making.

The use of artificial intelligence technologies can help to capture information, or even behaviours, to assist players and the facilitation team to analyse the results of a wargame. We are talking here about a tool such as "Aide de Camp"[15] or tools allowing to capture in-game data (audio, video, social distanciation…).

After-action reports are often produced in two stages:

[15] As described in NATO Analytical War Gaming - Innovative Approaches for Data Capture, Analysis and Exploitation, SAS-139, 2018

- **A “hot wash”:** a preliminary evaluation of the game with the main conclusions and lessons identified including a mood note on players’ appreciation of the game. This short report is produced in the days following the game session.
- **An after-action report**: formal report to the sponsor, outlining the game’s intention and objectives. It also includes an overview of the design and the gameplay as well as the main conclusions and recommendations for improvement. This report is produced a few weeks after the game session.

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