



# NIATO

WARGAMING HANDBOOK

# INATO



**Allied Command  
Transformation**

Norfolk, Virginia | USA



# FOREWORD



Wargaming is a powerful tool for generating insights into complex issues and problems. Whether the insights are from player decisions made in analytic wargames or insights for players participating in learning wargames, wargaming is a tested and effective method for organizations to generate greater understanding across the military and political spectrum at all echelons. The HQ SACT Experimentation and Wargaming Branch, supported by wargaming professionals across NATO, will continuously update and improve this handbook based on feedback,

lessons learned, and new technologies, methods, and best practices.

This first version of the NATO Wargaming Handbook intends to provide a foundation for NATO to develop a greater capacity to conduct quality professional wargaming. This book is built on outstanding source material and on a collection of best practices from our community. Still, we eagerly invite a broader consideration of this handbook by the professional wargaming community within the NATO Alliance to make this an exceptional tool for our wargaming practitioners.

This handbook provides a broadly applicable set of terminology, processes, and uses for wargaming. It is intended to give our practitioners within NATO the basis to conduct valuable and effective wargames. We recognize that many nations and organizations have longstanding and established wargaming traditions. This handbook is not meant to supplant those but merely to create a common framework and vocabulary for beneficial collaboration across the Alliance.

The NATO Wargaming Handbook is a “living document” that will continue to evolve and grow along with the NATO wargaming community. The Experimentation and Wargaming Branch is the handbook’s custodian and will gladly welcome your questions and recommendations.

**Guy Robinson, CB OBE**  
Vice Admiral, GBR Royal Navy  
Chief of Staff

Headquarters, Supreme Allied Commander Transformation

# DISCLAIMER

**This handbook is produced by Headquarters, Supreme Allied Commander Transformation (HQ SACT). This handbook is not, however, an official NATO publication and does not necessarily present or represent the official opinions or positions of NATO or individual member nations. Unless otherwise agreed, the copyright to this Handbook remains exclusively with HQ SACT. Absent specific permission, the handbook cannot be sold or reproduced for commercial purposes nor may the handbook be copied, reproduced, distributed, or publicly displayed without reference to HQ SACT.**

# PREFACE

*“What a delightful thing is the conversation of specialists! One understands absolutely nothing, and it’s charming.” - Edgar Degas*

## Purpose

This handbook serves as a simple, easy-to-use reference for conducting wargames. The handbook serves as a starting point for standardizing the vocabulary and processes used to deliver professional wargames. While we hope that a wargaming novice could construct a useful wargame based on the contents of this handbook, other references and training are far more detailed, both within Alliance Nations and within NATO. We include a list of helpful resources at the end of this handbook for those who are looking for more detailed instructions. In wargaming, the best reference is experience, so we encourage those interested in learning best practices to observe and participate in existing wargames and to start applying the simple processes in this handbook to help explore problems in their organizations.

## Context

Headquarters Supreme Allied Commander Transformation (HQ SACT) views wargaming as a tool to help drive change, create strong leaders, and generate sound analysis of new concepts, plans, and capabilities. Allied Command Transformation (ACT) is at the forefront of the effort to strengthen wargaming as a tool. Given the wide array of understanding and application of wargaming, this handbook is a first step in growing NATO’s shared understanding of wargaming and its applications. This handbook will serve as a foundation for the capability development and standardization of wargaming within NATO, but we do not believe that it is a perfect or complete document, so we welcome feedback from our community.

## Scope

The NATO Wargaming Handbook applies to professional wargames across all domains at various levels: international strategic, national strategic, strategic, operational and tactical. It is not limited to military games; in fact, we hope that this handbook will dispel some misperceptions that tactical military wargaming is the only type of wargame. While there is some overlap between hobby wargaming, scenario-based discussions, red teaming, exercises, and simulation-based analysis, as well as a host of other disciplines, this handbook will only cover professional wargaming as applicable to NATO and its political and military interests.

## Audience

This handbook focuses on the novice wargaming practitioner. For those fortunate enough to be experienced and skilled at wargaming, we hope that they will consult this handbook as a standardized reference for wargaming terminology and processes, in order to effectively communicate about wargaming within NATO.

# CONTENTS

<b>FOREWORD</b>	<b>1</b>
<b>DISCLAIMER</b>	<b>2</b>
<b>PREFACE</b>	<b>3</b>
<b>CHAPTER 1 - INTRODUCTION</b>	<b>5</b>
<b>CHAPTER 2 - WARGAMING FUNDAMENTALS</b>	<b>8</b>
<b>CHAPTER 3 - DESIGN</b>	<b>18</b>
<b>CHAPTER 4 - DEVELOP</b>	<b>32</b>
<b>CHAPTER 5 - EXECUTE</b>	<b>37</b>
<b>CHAPTER 6 - ANALYSE AND REPORT</b>	<b>43</b>
<b>CHAPTER 7 - DIGITAL TOOLS AND DISTRIBUTION</b>	<b>47</b>
<b>CHAPTER 8 - EVENT MANAGEMENT CONTACTS REFERENCES</b>	<b>50</b>
<b>REFERENCES</b>	<b>54</b>
<b>NOTES</b>	<b>55</b>
<b>CONTACTS</b>	<b>61</b>

# CHAPTER 1 - INTRODUCTION

*“Thus, it is that in war the victorious strategist only seeks battle after the victory has been won, whereas he who is destined to defeat first fights and afterwards looks for victory.” - Sun Tzu, The Art of War*

## Section 1 - What is Wargaming?

1.1 Wargaming is certainly not a new discipline and there are exhaustive histories available for those interested in the origins and evolution of the practice.<sup>1,2</sup> This handbook focuses on current uses and methodologies for wargaming. As a result, it will not delve into historical examples, as many of those would not qualify as ‘professional’ wargames using the definitions and criteria in this handbook.<sup>3</sup> Our definition of a wargame, covered in detail in chapter two, involves three key elements: players making decisions, friction introduced by the wargame mechanics, and feedback provided back to the players on the results of their decisions. Additionally, in NATO we split wargames into two broad categories: learning and analytical wargames, also discussed further in chapter two. What is clear from historical examples is that wargames have proven to be a valuable tool in generating insights based on the decisions made by the players. These can be insights from the players’ decisions that lead to further analysis and testing through analytic wargames. Conversely, these can be insights to the players during training or education as the players apply their new knowledge by making decisions in learning wargames.<sup>4</sup> Although we broadly categorize games into analytic and learning, most wargames will have elements of both when conducted properly.

## Section 2 - When is Wargaming Appropriate?

1.2 Wargaming is a powerful method. However, it is not always the appropriate tool given the situation. In general, wargaming should be combined with other methods to achieve comprehensive results. In analytical settings, wargaming generates insights that should be evaluated further through other analytic means. This can and often should be an iterative process, and these analytical campaigns<sup>5</sup> can contain a number of wargames, analytical studies, experiments, simulations, panels, and exercises. Likewise, in an educational and training environment, wargames can assist players to internalize material they are learning and generate insights for instructors in areas that may need more focus. As a general rule, wargaming has more value earlier in these processes, especially in analytic processes, and

is generally not suitable as a culminating event in analytical campaigns. Wargames are not validation tools by themselves, but can be valuable parts of validation processes.

## Section 3 - Benefits and Limitations of Wargaming

1.3 The many benefits of properly executed wargaming include:

1. An opportunity to explore options and take risks without risking lives or disrupting operations;
2. A cost-effective way to practise command and staff procedures;
3. Exposure to friction and uncertainty, including adaptive, thinking adversaries, competitors, adversaries, competitors, allies, and stakeholders;
4. A mechanism for exploring innovation;
5. A method for discovering new factors and questions not previously identified;<sup>6</sup> and
6. A method to build consensus and understand diverging perspectives.

1.4 There are also several limitations to wargaming as well, with the following common observations about wargaming:<sup>7</sup>

1. *Wargames are not reproducible.* Because wargames are all about human decision-making, no two wargames will ever be exactly alike. In analytical studies and research, being able to reproduce results is important for the validation of results, but the unpredictability of wargames is what leads to new insights that can then be the subject of new analysis.
2. *Wargames support qualitative analysis.* A wargame, by itself, is typically not appropriate as a quantitative analysis tool. When used in conjunction with more rigorous analytic methods, like operational analysis or simulation-based analysis, wargames can generate powerful quantitative results. By themselves, it would be difficult to structure wargames without considerable time and resources to generate meaningful quantitative results.<sup>8</sup> Efforts to do so can distract from what should be the focus of a wargame: the decision-making of the players.
3. *Wargames are not predictive.* Wargames generate insights into possible outcomes but should not be used alone to predict probable or likely outcomes. Put another way, wargames do not generate conclusions, but they can create insights that can lead to conclusions through further analysis.
4. *Wargames are only as good as the participants.* The wargaming participants, particularly for analytic wargames, need to be qualified and informed in their designated areas of expertise within the wargame. There is some debate that using uninformed participants can generate new insights, but there is little scientific evidence to the validity of this assertion or the actual value of these 'insights'. It is true that running through similar wargame scenarios with different participants is valuable to generate different insights, but the different participants should still be qualified and informed.





<sup>1</sup> (Caffrey, 2019)

<sup>2</sup> (Perla, 2011)

<sup>3</sup> Many historical wargames are more similar to tabletop or computer assisted exercises or even rehearsals and some older examples are more accurately described as purely games. Although Chess is prominently listed as an example of a historical wargame, it would not provide any meaningful insight into contemporary conflicts and thus should be considered a hobby game.

<sup>4</sup> (Development, Concepts and Doctrine Centre, 2017) (Appleget, Burks, & Cameron, 2020) We have broadly split wargames into two categories, which we will cover later in the book, analytical and learning based on their overarching purpose and context, although all wargames share elements of both analysis and experience.

<sup>5</sup> We use campaign as a way to express a process that incorporates several events or application of methods over time to reach a desired goal. This can be either an analytic campaign or a learning (training or education) campaign.

<sup>6</sup> (Development, Concepts and Doctrine Centre, 2017)

<sup>7</sup> (Development, Concepts and Doctrine Centre, 2017) We provide our own commentary to the four limitations listed in the UK MoD's Handbook.

<sup>8</sup> There is a temptation to view wargames as quantitative analytical tools with the inclusion of more structured adjudication methods like mathematical combat tables, but their primary (and appropriate) role is still in the qualitative evaluation of player decisions.

# CHAPTER 2 - WARGAMING FUNDAMENTALS

*“Therefore whoever desires peace, let him prepare for war.”*  
*- Publius Flavius Vegetius Renatus, Epitoma Rei Militaris*

## Section 1: What is a Wargame?

2.1 There are multiple definitions of wargames that are used by different authors and organizations (see 1.1), but the definition that this handbook will use from considerable discussion and collaboration within the NATO wargaming community is:

**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**

2.2 At its core, this definition contains three elements that are essential to all wargames: 1) players making decisions, 2) decisions driven and influenced by friction, and 3) decisions having consequences players must respond to:

1. **Players making decisions: Wargames are fundamentally about humans making decisions.** Players must be able to choose how to respond to the challenges introduced by the wargame. There is a tendency to confuse exercises, in which the participants are generally being evaluated on how well they display their adherence to training, plans, orders, tactics, techniques, or procedures, with wargames, in which the players are encouraged to make independent decisions and respond in different or innovative ways. It is also important to point out that the decisions need to be made by human players. If the decisions are being made by an automated system, then that is computer or simulation-assisted analysis and not a wargame.<sup>9</sup> As we stress throughout this handbook, wargames, analysis, and exercises are all important tools that have different purposes and are generally most effective when used together as part of broader analytical or educational campaigns.

***Player decision making is the most important part of every wargame.***

**2. Friction is a critical element of every wargame, generally introduced by competition or conflict by the game mechanics.** Friction is essential to generate new insights from the players' decisions or identify gaps or shortfalls that would not be generated if the players were making decisions in a scenario in which they were completely comfortable. There are many different ways to effectively introduce an element of friction into a wargame, such as the following:

- a. Opposing Force:** This is the most familiar type of friction in military wargames, an active adversary, possibly constrained based on the requirements of each wargame. This is often called the OPFOR or Red Cell.<sup>10</sup>
- b. Scripted injects:** More controlled than an active OPFOR, scripted conflict or competition can provide more control over the friction introduced to the players. The injects can be introduced by the wargame control team or through mechanics such as playing cards.
- c. Competition for / prioritization of scarce resources:** Often the game will make players compete for scarce resources, which could include things like geography, funds, public opinion, or numerous other aspects depending on the game's objectives. It can also force players to choose how to allocate scarce resources.
- d. Negotiations:** Another effective way to introduce friction is to have players negotiate based on their unique player goals within the wargame. Player goals are always a part of the wargame mechanics. The generation of trade-offs and compromises in this type of game can generate useful insights and analysis.
- e. Incomplete or conflicting information:** Forcing players to make decisions with imperfect information is another method of introducing friction in a wargame and should be carefully managed to support the game objectives. The "fog of war" can be a powerful method to influence player decisions, but it should be realistic and appropriate.
- f. Introduction of a new idea, concept, or capability:** Introducing elements in the wargame that players have not been previously exposed to can generate friction. This is often useful when evaluating future concepts or capabilities.
- g. Combinations of all of the above:** There is no hard rule about how friction is generated for the players, only that it needs to support the wargame's aim and objectives. Having combinations of the above methods in one wargame is always an option.

**3. Consequences:** The third critical element for every wargame is communicating consequences to the players about the decisions they are making. We call this the 'wargame adjudication', which is accomplished in a variety of ways (some examples of which are provided below). Whatever method is used to adjudicate, capturing the results and the reasoning behind the results is critical to every wargame and should be planned and resourced as part of the wargaming process. We cannot stress enough that players and sponsors must have trust in the adjudication process, so whatever the method chosen, the players must feel that the results are believable and relatively accurate.<sup>11</sup>

- a. Expert judgement:** The simplest form of adjudication is to have a person or group consider the actions made by all the players and render judgement that is communicated back to the players. This can be done by experts in the subject matter of the wargame or by senior leaders with experience in similar scenarios, and can be assisted by manual or computerized resolution tables.<sup>12</sup>
- b. Consensus:** Another simple adjudication method is to have the players discuss their actions and come to a consensus on the likely outcomes. This can be facilitated by a moderator and may include some simple weighted probability checks. A matrix wargame uses this form of adjudication.
- c. Analytically assisted:** Some wargames may rely on models or simulation. With enough time and resources, the player's decisions can be represented in a computer simulation and results adjudicated that way. Simple models or adjudication tables, derived analytically from historical or engineering data, can also be used to provide the consequences to the players.
- d. Rules-based adjudication or systems-based adjudication:** Some games rely on pre-determined rules to adjudicate the player's actions. For example, if player X does action Y, it generates result z. Some might refer to these as serious games, but these are still wargames based on the definition we have adopted. Games that use this method of adjudication only require someone familiar with the ruleset of the game to facilitate the game to make sure the game proceeds properly. Popular board games like Risk and Settlers of Catan are examples of this type of game, but there are many professional wargames that use similar mechanics to explore decisions players make during the wargame. Adopting mechanics like this must still have some analytic basis. Commercial board games may have interesting mechanics, but they are designed to be fun and fair to the players and may not have much analytic rigor behind the mechanics.

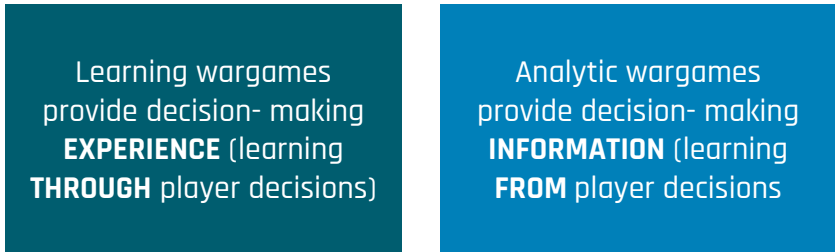
**2.3 Safe-to-Fail:** We did not list this as a critical element of a wargame, but allowing players to make informed decisions using their best judgement without fear of negative consequences is essential for players to explore the array of decisions and their potential outcomes. In fact, some players refuse to make decisions at all in wargames because of the fear of judgement for making the wrong decision. This makes effective wargaming impossible and is an element of NATO culture that should be accounted for when designing the wargame and when selecting and preparing the players. Wargame sponsors must be open to *all* of the insights from their wargames, both positive and equally as important, negative insights. Wargames can be quite valuable at revealing gaps and shortfalls in plans and concepts, but only if the sponsors are willing to accept them.

**Safe-to-Fail assumes that players will still strive to make good decisions given the wargame scenario, the information they have, and their best judgement. It also retains the requirement for the players to explain their decisions for the necessary analysis of the wargame.**

**2.4 Wargames create narratives:** When adding the three essential elements to the wargame scenario, a narrative should be created that will provide several things: an interesting and hopefully enjoyable experience for the players; a credible series of actions and reactions from the different players and the wargame team; and a believable set of insights and useful analytic material for the wargame sponsor. It is important that the players feel engaged and that the wargame structure flows smoothly without lengthy distractions that do not add to the wargame objectives. As we will discuss later in the design and development chapters, the scenario must provide enough information to make the players feel engaged and informed but not so much information that the player is overwhelmed or loses the purpose of the wargame.

## Section 2: Types of Wargames

**2.5** Broadly speaking, there are two types of wargames: learning and analytical.<sup>13</sup> Both types of games are very similar in the process to create and execute. Fundamentally, both wargames are about learning from decision-making, and both types require creating a narrative-driven experience for the players. However, an analytic wargame will require more effort to craft a data collection and analysis plan (DCAP) to ensure achievement of analytical goals and have a more robust reporting requirement in order to inform a broader campaign of analysis. In learning wargames, there is still a need for some data collection and analysis; however, this is focused on the ability to convey the learning points to the players, which are built into game design.



**Figure 1: Difference between analytic and learning wargames**

**2.6 Learning Wargames:** Training and education wargames are excellent tools to give players the ability to make decisions in challenging situations and receive valuable feedback on their decisions. These types of wargames allow the players to apply newly acquired knowledge or create a better understanding of new or poorly understood concepts and ideas. Typically, the analysis for these games will be simpler and will focus on whether the wargames achieved a better understanding for the players. These wargames also allow trainers and educators an engaging way to evaluate what their students have or have not learned.

**2.7 Analytic Wargames:** The design and execution of analytic wargames focuses on maximizing their contribution to a larger analytical effort. Usually the wargame's objectives are accompanied by research questions that are answered by the game, whether that is exploring a problem in greater detail, testing a hypothesis or assessing solutions. A wargame designed to assess a plan, concept, strategy, future state, course of action (COA), or other topic for analysis is an analytical wargame. Analytical wargames follow many of the same procedures in their creation and execution as learning games but require a more rigorous analytic process to gain the desired insights. Although the focus of these wargames is analysis, the creation of a believable experience for the participants is still important to the wargame's success.

**2.8 Rigidity and Adjudication of Wargame Decisions:** Categorizing games as specific types or with given names, is confusing.<sup>14</sup> Generally, most efforts to categorize wargames are really categorizing the method of adjudication in the wargame. There is a continuum of wargame structures based on their rigidity and reliance on systems and rules. On one end of the spectrum are wargames based entirely on discussions between the participants with little structure or rules. At the other side of the spectrum are extremely rigid games based on rules, systems, or digital simulations adjudicating player decisions in a very causal fashion. Most wargames will fall somewhere between those two and will use a mix of rules and expert judgement to adjudicate player decisions. Both extremes are still wargames if the three key criteria are met.

This handbook mentions different adjudication methods, but there is no firm rule on how each wargame should be adjudicated except that it needs to be credible both to the players and to those who will receive the outputs from the wargame.<sup>15</sup>

Although we do not advocate naming specific game types as opinions can vary on their form and function, we include some commonly used wargame types here and explain what they are practically.

#### More Rigid:

- Simulation: player decisions are adjudicated by a simulation.
- Rigid Kriegsspiel: player decisions are adjudicated using a system of rules and mathematical tables.

#### Less Rigid:

- Free Kriegsspiel: player decisions are adjudicated by an expert or expert panel.
- Matrix: matrix wargames are adjudicated using player consensus on the probability of actions succeeding or failing.
- Seminar: this is the least rigid of the common wargame types and is a discussion led by a facilitator. There is no formal adjudication in this format, simply a structured discussion between players about their actions and likely consequences

**Figure 2: Common Wargame Types<sup>16</sup>**

## Section 3: Wargaming Process

2.9 As this Handbook is intended to create a standard vocabulary for wargaming within NATO, we define the wargaming process in four steps: design, develop, execute, and analyse/report (see Chapters 3-6). There are slight differences in terminology used by wargaming experts, but generally, all use a similar methodology. The process starts with design, which includes the initiation of the wargame by the sponsor and laying out the basic parameters (scoping) of the wargame. The second step is development, where the mechanics of the wargame are tested and refined. The third step is the wargame's execution, and the fourth step is the analysis/reporting stage. Although we list this as the final step in the process, analysis must be part of the entire process to be effective. This Handbook also includes a section on event management, as every wargame is part of an event or series of events that have requirements well beyond the presentation of the game itself. Poorly executed events can ruin otherwise good wargames.

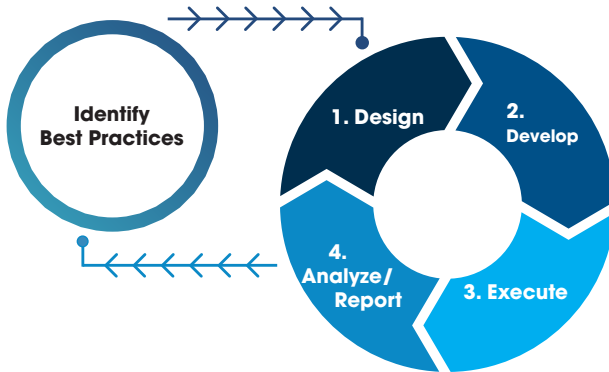


Figure 3: The Wargaming Process<sup>17</sup>

## Section 4: Wargaming Team

2.10 We choose to call these positions 'roles' because every wargame will tackle these roles in different ways. Smaller wargames may have a single person fill multiple roles while larger wargames can require several people to fill each role. As we go through the wargaming process in the following chapters, we will indicate which roles are needed at each step of the process to help clarify the requirements.

- 1. Sponsor:** The sponsor owns the requirements that generate the wargame, which are a problem and a desired outcome or product. The sponsor is also generally responsible for resourcing the wargame, although the organization delivering the wargame may also bear some of the resourcing responsibilities. In games sponsored by senior decision makers (e.g. flag officer or senior civilian); it is recommended that the sponsor appoint a knowledgeable representative empowered to make decisions to participate fully in the wargaming process. However, it is important to note that touchpoints with senior leaders are still vital to the wargame's success.
- 2. Wargame Director:** The wargame director is responsible for the overall wargaming project and will supervise the wargaming team throughout the process. Generally, the wargame director will lead the interactions with the sponsor to make sure that the wargame is meeting the sponsor's requirements. The wargame director is responsible for leading all four steps of the wargame process.
- 3. Game Designer:** The designer(s) will be responsible for the design of the wargame, although they will work closely with the analyst(s), developer(s), scenario team, and



wargame director. For most organizations, the designer and developer roles are combined, but for very large wargaming teams, these may be different.

- 4. Game Developer:** The developer will refine the wargaming structure and products through playtesting to make sure the game is playable and supports the sponsor's requirements. The developer takes the rough design elements, including the scenario, teams, analysis plan, and time constraints, and creates a polished and playable wargame through multiple playtests.
- 5. Analyst:** A lead analyst should be involved from the very beginning and will provide input to the designer/ developer to make sure that the game will answer the research questions needed to meet the game's objectives and provide the sponsor with useable feedback from the wargame. For learning wargames, the analyst position is not as important, but it is still valuable for determining the value and impact of the wargame. For analytic wargames, the lead analyst will likely coordinate a team of supporting analysts (plan for at least 1-2 analysts per player team during execution). Analysis is mentally fatiguing, so it is a good idea to have more than one analyst working together for longer wargames.
- 6. Scenario Designer:** For wargames that need a realistic or complex scenario because of the subject matter, it is advisable to employ a separate scenario designer to assist the wargame designer with background material and vignettes. Scenario development may also require the inclusion of subject matter experts to ensure accuracy of the scenario. A good practice is to use the opposing player team (see below), if available, to help with this role, particularly in military focused wargames.
- 7. Non-player teams:** We only list this team separately from the other player teams because in many wargames the 'Red' Cell or Opposition Forces (OPFOR) can be constrained to meet wargame objectives. Although the OPFOR (or any team or side in a wargame that is not independent) acts as a player in many wargames, they often work with the wargame execution team to ensure that all the wargame objectives are met. They may be involved in the development and background of the wargame. They should be involved in the development and employment of any forces or effects that they might use in the wargame. In many wargames, the opposing forces will be partially or completely under the oversight and direction of the wargame director. The reverse can also be true. Some wargames are specifically looking for insight into an adversary, so the opposing forces' decision-making may be the principle focus of the wargame with a constrained friendly team.
- 8. Event Manager:** Planning and executing the events related to the creation, execution,

and analysis of the wargame can be as much work as the wargame itself, so having a dedicated person or team to manage the events' logistics, registration, security, IT, facilities, etc. will remove a huge burden from the wargame team. Poor event management can ruin the best-designed wargames and should not be ignored or delayed. The event manager should be involved in all wargame planning, including the initiation and scoping events.

- 9. Players:** The players are the most important part of the wargame team. They will provide the decisions, discussions, and insights. The players should be qualified for the role they fill and familiar with the game system before starting. Players will typically be placed in teams, each team having particular goals<sup>18</sup> to achieve in the wargame which they should understand and support. There is no need to assign colours to the teams, as they can simply describe their roles with names like 'Country X, Multinational Organization Y, or Criminal Group Z'.
- 10. Adjudicator:** Regardless of the adjudication method chosen, a wargame will still need designated adjudicators, even if only to make sure that a digital adjudication tool or simulation is being properly used. The adjudicator(s) will ensure that the player's decisions are properly adjudicated and communicated clearly back to the players.
- 11. Facilitator:** It is imperative that wargames stick to the time line and rules for the game and that the players are providing the proper types of input for the wargame to meet its objectives. Facilitators make sure that the game stays on time and that the players understand the rules and inputs. Facilitators generally perform a variety of tasks that might be required to properly execute each wargame. A best practice is to have at least one facilitator for any physically separated player team, so if multiple teams are in different rooms or even remote locations, a wargame facilitator will be with each of them. The game director will manage and direct the facilitation team.



<sup>9</sup> There are powerful tools being developed that can quickly run through thousands of runs of simulated decisions, battles, and campaigns. While these generate powerful data sets, they can only be considered a wargame if there are human players “in the loop,” that is, making decisions that then drive the simulations.

<sup>10</sup> Unfortunately, the term “red team” has taken on a specific meaning that can cause confusion. Red teaming is an entirely separate discipline. We advocate giving player teams descriptive names as different countries and traditions may use colors in different ways in their exercise procedures to describe teams. For example, there may be several opposition factions with distinct goals and methods, so lumping them into a single “red” cell can cause confusion.

<sup>11</sup> Wargames are abstract models, so they will never completely replicate the real world. The goal is trust in the results, not 100% accuracy to the real world. Wargames can be completely ruined by a desire to make them “realistic,” which can cause participants to forget that they are about decision making and insights.

<sup>12</sup> A resolution table is typically used in tactical force on force wargames to determine the probability of outcomes of a combat interaction. The probability is informed by pre-determined factors that make up the forces engaged in the combat interaction.

<sup>13</sup> (Development, Concepts and Doctrine Centre, 2017)

<sup>14</sup> We will note one exception. Matrix-style games are a richly established, relatively easy to adapt, community-supported wargaming method that uses a mixture of discussion and simple tables to adjudicate. For a great tool to get started, we recommend the Matrix Wargame Construction Kit found on the PaxSims website. (Bryan, Mouat, & Fisher, 2023)

<sup>15</sup> Credibility in the adjudication method is critical for the wargame’s results to be accepted by the players and the consumers of the wargame analysis. If relying on human adjudication, one must employ credible experts to conduct the adjudication. If relying on systems or rules to adjudicate, it is important to understand those rules and the data that supports them. If using combat tables, it is critical to use current and credible ones. For example, using industrial age warfare tables to adjudicate future digital multi-domain combat would reduce or eliminate confidence in the adjudication. One should not assume that combat tables from commercial hobby wargames are valid or accurate without verification of their sources.

<sup>16</sup> (Pournelle, 2017)

<sup>17</sup> (Development, Concepts and Doctrine Centre, 2017) We have taken and modified the process from this source. Some experts will list initiation as a separate step from design and some may add an addition step after execution, but generally the process is the same.

<sup>18</sup> Unless it is a specific objective of your wargame that the players develop their own objectives, players must be provided with their goals and victory conditions. This should be carefully worked into the design and development process and should be one of the first things explained to the players by the wargame facilitators.

# CHAPTER 3 - DESIGN

*“The man who asks a question is a fool for a minute, the man who does not ask is a fool for life.” - Confucius*

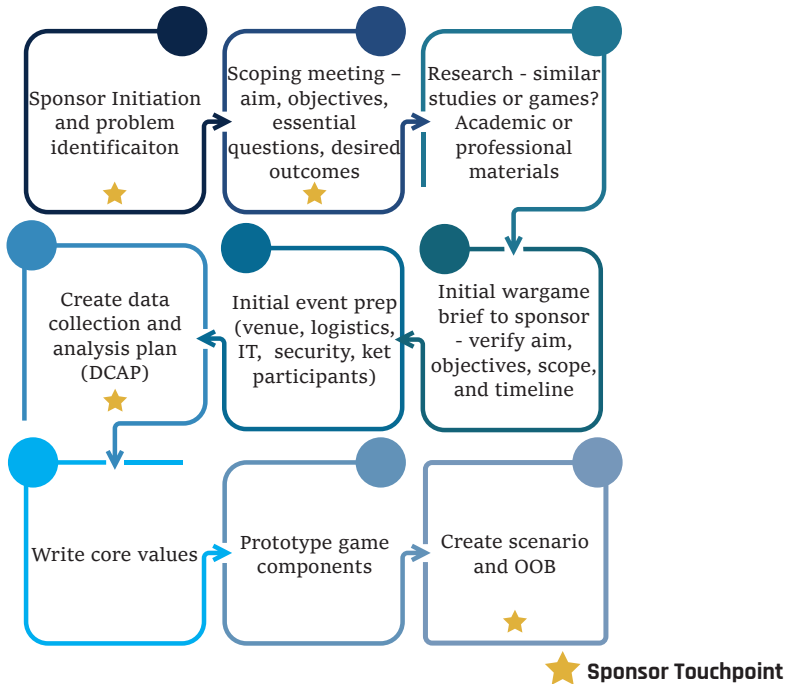


Figure 4: Design Step Detailed Process

**3.1 Design.** The process of creating the core elements and overall draft of the wargame is all part of the design step

*“If I had an hour to solve a problem, I’d spend 55 minutes thinking about the problem, and 5 minutes thinking about solutions.” - Albert Einstein*

**3.2 Initiation.** The wargaming process starts with the sponsor’s problem. Both analytical and learning wargames should be created to deal with a problem identified by a wargame sponsor. If a sponsor initiates a wargame without a problem statement or question, the wargame team should not proceed with any other design steps until they can work through the problem to be

## Examples of Problem Statements

Analytic:

"We are unable to move enough supplies to support offensive operations in area x due to...."

"We are unable to effectively prevent action x under the limits of our current policies."

"We don't understand how to effectively employ autonomous surveillance in areas with denied positioning, navigation, and timing (PNT) access."

Learning:

"Our staff does not understand how to employ tactical cyber effects in support of an operation."

"Our students don't have a practical way to internalize the concepts we are teaching in course x."

**Figure 5: Problem Statement Examples**

addressed with the sponsor.<sup>19</sup> The problem may be substantial enough that a single wargame may not be able to solve it, in which case the wargame team should help the sponsor develop a series of analytic events to properly address the problem.<sup>20</sup>

**3.3 Scoping Event.** Once the wargaming team has identified the problem that the wargame will help to address, it is time to do an initial scoping meeting with the sponsor that will drive all other wargaming activities. During the scoping meeting, the wargaming team and the sponsor(s) must agree on the following items which will become the central design guidance for the wargame. If the sponsor is unclear on the problem or the elements which follow, this may require several meetings with the wargaming team to make sure that the wargame will meet the sponsor's requirements. Creating a briefing slide for each of the following topics is an easy way to manage the scoping event.

**1) Aim:** As this is a concise statement of why the wargame is being conducted, it will specifically address the problem in some way. The aim sets the focus and scope for the sponsors, designers, and analysts to ensure the wargame provides the necessary structure and rigor to achieve the desired outcomes.<sup>21</sup> Execution of a wargame will be difficult enough without introducing elements into the wargaming event that do not

## Examples of Aim and Objectives:

Aim: Assess the coherence of Plan X and Plan Y

Objectives:

- 1) Assess alignment of cross-domain effects and actions
- 2) Assess operational gaps between the 2 plans
- 3) Assess the ability of Headquarters X to command & control both plans simultaneously

Aim: Examine U.S. synchronization requirements with Allied maritime plans in order to enhance unity of effort, mitigate risk, and inform Allied force allocation and employment decisions.

Objectives:

- 1) Identify and examine national decision requirements (who, what, when, where, and why) and challenges of Transfer of Authority (TOA) to include national high-end maritime forces to NATO
- 2) Identify and examine the coordination, de-confliction, integration, and synchronization challenges and requirements across Allied maritime plans
- 3) Provide a forum for Allied maritime planners to discuss and refine plans under development

**Figure 6: Aim and Objective Examples<sup>22</sup>**

directly support the wargame's aim - at best this will cause confusion and at worst, it can completely ruin the wargame and its required outputs.

**2) Objectives:** Each wargame will have a small number of key issues that will be explored to meet the aim of the wargame called objectives. The objectives will drive the design, analysis, and topics covered in the scenario. Typically, limiting the number of objectives to no more than three or four will improve the coherence of the wargame and prevent a tendency to do too much in too little time. If the design step generates more than four objectives, it is important to eliminate objectives with the sponsor or plan for more than one wargame.

**3) Desired Outcomes:** It is critical to set the expectations for the outputs or products that a wargame will generate. Two critical details that a wargame team must understand to properly build the wargame and conduct analysis are as follows:

### Example Wargame Outcomes and Uses (Outcome and Uses Underlined)

"As part of a wider gap analysis study on future force structure, projected friendly forces were run through a future operational scenario against anticipated adversary capabilities. The identified gaps will be used to develop more effective force structure targets in next year's force development report to the council."

"The wargame will generate awareness and understanding in the working group about the inadequacies of current policies to effectively respond to current crisis conditions. This will inform the upcoming deliberations on policy updates."

"The chosen course of action and force package will be loaded into a detailed simulation to generate expected losses in forces."

"Students will be evaluated on their ability to utilize convergence and synchronization in their tactical plans. This evaluation will determine the focus of the next block of instruction."

#### Figure 7: Examples of Outcomes and Uses

a. **What products will this wargame generate?** Many wargames generate a wargame report that covers the findings of the wargame in some detail for the sponsor and other interested parties. It is not necessarily a long, formal report; some wargames may just generate a list of insights or a table of outcomes, or may mix several different products.

b. **How will these products be used?** The wargame team should have a clear understanding of how the sponsor will use the wargame results. Wargaming is generally part of a process of analysis or learning and will typically be followed up by other events that will use the insights gained in the wargame as inputs. For example, if the players' wargame decisions are fed into a simulation analysis, the decisions must be recorded in sufficient detail and clarity. Make sure that your concept of analysis is structured to capture the relevant data needed for your desired outcomes and the next steps in your analytic or learning process.

**4) Milestones:** The wargame execution window and the major touchpoints between the sponsor(s) and the wargame team should be agreed upon at the scoping event. Although both parties can agree to deviations, it is important for scheduling and resourcing to establish a realistic timeline and milestones at this first event.

**5) Concept of Analysis:** For analytic wargames, it is appropriate during the scoping event to provide a concept of analysis that includes an initial set of essential questions that need to be answered to achieve the aim and objectives of the wargame. This should be conducted by the lead analyst and should give an initial framework for the data collection and analysis plan (DCAP). This step is optional at the scoping event, but the analyst team will have to identify the research questions early in the process to help with the wargame design. Wargame Analysis needs to be a factor in all elements of the design and development of an analytical wargame and should not be an afterthought. Ideally, a lead analyst is assigned to the core wargame design team. They will be responsible for creating a Data Collection and Analysis Plan (DCAP), and for ensuring the game design can meet the analysis needs. Key elements where analysis is essential include:

a. **Problem Formulation.** An analyst can help structure or understand the problem that the wargame is being designed to solve.

b. **Selection of Appropriate Methods.** An analyst can advise on appropriate wargame methodologies, but will also ask the question is a wargame the best method to use? What alternative methods are available? Assuming a wargame is appropriate, alternatives methods such as modelling and simulation, decision analysis or systems dynamics may complement the wargame to gain a rounded picture of potential solutions.

c. **Wargame Aim and Objectives.** As part of the core team, the lead analyst will look to ensure the aim and objectives are relevant to the problem, attainable within the scope of the game and measurable. It is the lead analysts' job to provide evidence for whether the objectives have been met or not and this is very difficult if they are poorly articulated from the beginning.

d. **Bias Check.** Wargames can be particularly susceptible to certain types of bias. A common one is confirmation bias, where the game is designed to almost guarantee a certain outcome that the sponsor wants to see (e.g., a weak adversary team to make the friendly team look good). Analysts should be neutral to the outcome of the game and highlight areas of potential bias when they see it.<sup>23</sup>

e. **Adjudication.** Operational analysis can be used to inform the adjudication process, for example by assigning probabilities to a range of outcomes and creating an adjudication matrix to be used in the game.



**6) Initial constraints, limitations, and assumptions:** Some sponsors may have specific requirements that the wargame team must understand.

**a. Constraints:** These will be specific requirements from the sponsor that bound the wargame's scope and design. Common examples are geographic boundaries, force readiness levels, rules of engagement, etc. This is not the same as operational planning; it is simply requirements and limits provided by the sponsor. They are what the wargame team must or must not do.

**b. Limitations:** These are things that the wargaming team cannot do. It can be due to lack of sufficient data, concept maturity, short timelines, lack of expertise, lack of suitable facilities or IT support, etc. Identifying these early with the sponsor will create clear expectations and mutually agreed solutions or workarounds.

**c. Assumptions:** An initial set of assumptions related to the wargame's development and execution necessary for the wargame's success. Just as with planning, the wargame team should try and validate the assumptions (confirm that they are facts) as soon as possible with the sponsor. Common assumptions could be the availability of data, experts, models, and facilities.

**7) What should this wargame model?** It is probably premature to define the model and its complexity at this stage of design, but an initial discussion with the sponsor about what may need to be represented in the wargame is a good idea. Some sponsors may have a wargame model or simulation already in mind, and a simple discussion about selecting a model once the wargame design concept is complete is essential to an effective wargame. The wargame's aim, objectives and outcomes should drive the selection of appropriate models and not the other way around (i.e. do not start with the model).

***Design with the end in mind. Every element of a wargame should support the aim, objectives, and desired outcomes. If any element does not support these, then it should not be included in the wargame.***

**3.4 Research.** Following the scoping engagements with the sponsor(s), the wargame team will need to conduct research that will inform the design of the wargame. This research will typically cover the following areas:

**1) Topic to be explored by the wargame:** It is important that the wargame material be believable by the participants. This means that the scenario, mechanics, and represented elements are accurate, realistic, and current (for future focused wargames,

this can mean using the most current speculative research on future conditions). For complex topics, this will require the help of subject matter experts in the areas being considered.

**2) Wargame mechanics:** There may be other wargames that have looked at similar topics in the past that can provide valuable insights into the design of the wargame. While we advocate learning from and borrowing mechanics from previous wargames that make sense, each wargame will have different variables in its creation, so be careful not to force new aims and objectives into an old wargame structure. The design and development of a wargame must be carefully managed for every wargame to meet its unique requirements. For less experienced wargame designers, adapting a suitable existing wargame structure can be useful and may be a better idea than starting from scratch.

**3) Forces or elements:** Forces or elements in a wargame should be realistic and believable, so research should be conducted on existing forces and elements. Some games do not require a complete replication of real-world forces, but even fictional forces or elements should be believable and realistic enough to provide good insights into the problem being explored. For example, if not running an operation oriented wargame, it can be distracting for players to deal with complete orders of battle (ORBAT). Designers should carefully consider the complexity of information given to the players. The goal is to provide just enough, but not too much. Over-complexity not only distracts the players, but also creates more work for the design team than is required, which will lengthen and complicate the design process.

**3.5 Design Brief.** Following the initial research, the wargame team must brief the sponsor. This wargame design brief should, at the very least, include the following elements (Note: Include at least one slide on each of these in the design brief)<sup>24</sup>:

**1) Refined problem statement.**

**2) Refined aim and objectives.**

**3) Refined wargame desired outcomes.**

**4) Refined concept of analysis.** This is an initial overview of the potential methods of data collection and analysis for the sponsor.

**5) Rough sketch of the scenario.** This would include an initial idea of the context and setting in which the wargame will take place.

**6) Initial wargame format.** This will give an initial idea of the type of wargame and how it will be adjudicated.

**7) Initial wargame structure.** This should give an initial idea of how long the wargame will last, how many teams will play, and who the players will be representing. This is just a starting point and will probably need to be refined during the development process, so make sure the sponsor understands that playtesting will likely lead to some adjustments.

**8) Timeline and milestones.** The sponsor needs to agree to a realistic timeline for design, development, execution, and analysis. It is also necessary to schedule required touchpoints where the sponsor will provide input and approval.

For more formal wargaming processes, this initial design brief may be followed by a signed agreement (e.g., a Memorandum of Agreement) between the sponsor and wargaming team that affirms both sides' commitment to follow the timeline and dedicate the resources necessary to have a successful wargame. This is a good practice but may not be necessary for less formal, internal wargames.

**3.6 Design.** After receiving the sponsor's approval for the initial design proposal in the design brief, it is time to begin the game design process. It is best to wait for the sponsor's approval and guidance from the design brief before starting the detailed design process outlined below. This is why it is important to conduct the design brief as early as possible with the sponsor. The steps below will be occurring simultaneously, and they should be linked, as each element is necessary for the others to work properly.

**1) Initial Event Preparations.** We recognize that every organization has formal event management procedures in place and we do not suggest replacing those, only that they be included in the wargame design, development, and execution processes. Event management is critical to the success of a wargame, so starting on this process early is important (see Chapter 7). It is important to note that improperly planning the event can hamper or even ruin the wargame. We recommend having a dedicated event manager or team for the wargame as this can be quite time consuming. The following items, which will play into the wargame design, are all part of event management:

- a. Facility size and number of rooms.
- b. Security.
- c. Information Technology (IT) support.
- d. Lodging and transportation.
- e. Dining/ refreshments.

- f. Registration.
- g. Invitations.
- h. Messaging.
- i. Break areas.

**2) Create the Data Collection and Analysis Plan (DCAP).** If running an analytic wargame, an analyst must be involved in the entire design, development, and execution of the wargame. The DCAP will be designed and developed in parallel with the wargame, as the entire point of the analytic wargame is to collect the right data to meet the aim and objectives of the wargame. Chapter 6 provides the basics of wargame analysis, but it is advisable to have a trained analyst handle the data management and analysis tasks. The wargame designer(s) must closely work with the analyst(s) to make sure that the scenario, rules, and mechanics can produce the data needed to meet the wargame's aim. Some details regarding analysis and data collection methods are detailed below to help inform the design step.

**a. Integrated Data Collection methods.** Data collection methods can be embedded into the wargame design to minimize the burden on players. For example, turn sheets, request-for-information (RFI) forms or game counters can be valuable information for analysts while at the same time useful for players.

**b. Non-Integrated Data Collection methods.** Other methods for data collection may not be fully integrated into the game play, but are often necessary to measure the objectives. Examples of these are pre- and post- game surveys, passive observers with data collection sheets to fill in, or post-game hot-wash sessions.

**c. Measures, Research Questions and Data Collection Methods.** Table 1 shows the relationship between the wargame objectives and the data collection. Typically, the wargame objectives need to be broken down into sub-objectives for the analysis. The research questions, or measures of effectiveness and performance, are detailed and linked to each sub-objective. The analyst will also anticipate how each question will be answered through the data collection methods - for example will the question be asked in a hot wash session, on a player survey, or will the information from the turn sheets be used?

**3) Create the rules and mechanics.** As there are many ways of running a wargame, this handbook will not go into the specifics of rules and mechanics. However, the following items must be addressed in the design of the wargame:

**a. Player goals.** Each wargame should provide the players or teams with the goals

Wargame Objectives	Sub-Objectives	Research Questions or Measures	Data Collection Methods	Observations
Objective 1	Sub-Objective 1a	Question 1, Question 2, Measure a	Turn Sheets Player action	
	Sub-Objective 1b	Question 3, Question 4 Measure b	Post-wargame survey Hot wash session	
	Sub-Objective 1c	Question 5, Measure c	Hot wash session	
Objective 2	Sub-Objective 2a	Question 6	Hot wash session	
	Sub-Objective 2b	Question 7, Measure d	RFI sheets	
	Sub-Objective 2c	Question 8	Turn sheets	

**Table 1: Sample Data Collection Matrix**

they are trying to achieve in the wargame. Some wargames may go a step further and call these 'winning conditions.' This is optional. The key is to make sure the players understand what is guiding their decision making during the wargame. Some wargames ask the players to define their goals or strategy as the first step in game play. In the after-action review, a common question is "Did you achieve your goals? Why / why not?"

**b. Number and Length of Turns.** Remember that wargames are valuable for the players' insights, so they must have enough time to properly think and react. It is tempting to put too many turns into a wargame. At the same time, there have to be enough turns to force the players to live with the consequences of the decisions made in the game. Proper playtesting in the develop phase will help to guarantee that the turn number and length work for the wargame objectives. Turns can be a few minutes in more rigid games, but can stretch into hours or even days for very complex strategy games.

**c. Player Inputs.** The inputs required from the players must be clearly defined during this period. Inputs could be something simple like moving a single unit or providing a simple narrative argument. They could also be something more complex like an operational scheme of manoeuvre or a detailed budget plan. An input needs to be

## Examples of Player Goals

“Repel offensive at location x.”

“Keep your leader alive until turn 5.”

“Establish favourable trading conditions with country x.”

“Destroy 40% of your opponent’s air defence assets.”

“Discover who is conducting cyberattacks on your power grid and respond appropriately.”

“Avoid going to war with country x.”

**Figure 7: Player Goal Examples**

just enough to address the wargame objectives and collect the correct amount of data. A good practice is to use turn sheets, cards, or a digital input tool that bounds the amount and type of inputs the players are allowed to make. Forcing the players to prioritize their inputs through the structure of the wargame is a good way to gather insights for the analysis. Remember that the players need to stay engaged, so don't make the input requirements so difficult that the players lose interest in the game.

**d. Adjudication Method.** There are many ways to adjudicate wargames; there is not one best way. The adjudication choice will very much depend on time, people, wargame objectives, and the type of data needed. See section 2.5, Feedback, for a discussion on adjudication. The more rules and rigid mechanics incorporated, the more extensive the playtesting will need to be.<sup>25</sup>

For most NATO wargames, a combination of the following four adjudication methods should work:

**i) Expert judgement.** This can be a single expert/leader or can be a panel of experts/leaders deciding the consequences of the players' decisions.

**ii) Consensus.** Some wargames may rely on an agreement between players about the likely consequences of players' decisions.

## Examples of Scenario and Vignette explanation to players

There are many ways a wargame team can help players understand the situation to speed up the preparation phases of the wargame. However, large packets filled with information may not be the most effective way to engage players in the scenario and necessary background for the wargame. In fact, it is a good assumption that players will not read dense read-ahead packets. We offer the following as other methods to help players understand the situation, methods that do not rely on large amounts of data or prose.

- Maps, both digital and physical, showing the locations and disposition of forces.
- Simulated media products: newscasts, newspapers, social media posts
- Player aids: cards, placards, sheets or digital dashboards that succinctly and effectively present key data about the scenario to the players.
- Role-players: An effective method to introduce important information is to have role-players participate with the players to represent key factions in the wargame.
- Effective tables, charts, and diagrams: these data visualization tools can be very effective in showing relationships between different elements in the scenario.

### Figure 8: Sample Ways to Introduce the Situation

**iii) Analytically assisted.** This covers wargames that use analytically derived tables, algorithms, or simulations to determine the consequences of player's decisions.

**iv) Rules based.** Some wargames may use rules-based adjudication, which uses set outcomes for player decisions. If a player makes decision x, then outcome y.

**e. Feedback Mechanism.** A critical element of any wargame is providing the players feedback from their actions. The method and parameters of this feedback should be defined during the design phase. This is primarily the consequences of all players' actions and reactions clearly communicated back to the players. It will probably involve both verbal and visual feedback to the player about the consequences of their actions.<sup>26</sup>

**4) Create Scenario and Forces/Elements.** The scenario is the context or setting in

which the game takes place. It typically includes the time (e.g. historical, current-day, or future), the geography, a narrative of what has happened so far (often called 'the road to crisis/conflict'), and key elements under each player's control. Often a scenario is accompanied by vignettes. If a scenario is the overall storyline, the vignettes are chapters within the story, representing a smaller sub-set of individual events. As an example, a 3-day wargame may tackle three individual vignettes (one per day). The scenario should be just detailed enough for the players to make informed decisions that support the wargame's objectives. Having too much information can be confusing and distracting, but not having enough information can lead to frustration in both the players and wargaming team. One way to mitigate this difficult balance is to have a responsive RFI (request for information) process in place for more complex wargames. Many participants will show up with no knowledge of the scenario and elements under their control, so forcing them to learn and search through a mountain of data might not be useful to their decision making. It will also be frustrating and unenjoyable, which will often lead to wargame failure.

For simulation-supported wargames, the scenario, force structure, and game components will be created in the simulation and reside within the wargame database. Careful attention to the database is just as important in this type of wargame as any other scenario and will need to be validated by experts prior to execution. Current simulation options typically do not have easy mechanisms to correct mistakes during execution. They may have workarounds, but this may impact the value of the wargame analysis.

**5) Prototype Game Components.** It is necessary to playtest the wargame in the next phase (development), so part of the design phase is creating all of the elements needed to execute the game. For physical wargames, these elements will include maps or game-board, game pieces, cards, adjudication tools, turn sheets, etc. For digital and distributed wargames, these can include the visualization tools, simulation tools, etc. It is not necessary to create professional-looking components at this point as changes may be needed during the development phase.

***Design just enough, but no more than your objectives require.***





<sup>19</sup> If faced with a sponsor that wants to conduct a wargame as a demonstration or show, it is still important to work through the problem statement with the sponsor, which could be something like “Not enough leaders in NATO understand the value of wargaming!” Wargames started without a valid problem are aimless and unlikely to generate actionable outcomes.

<sup>20</sup> Defining the problem to be addressed can be an entire process itself and should be considered a key element of every analytic campaign or study.

<sup>21</sup> (Appleget, Burks, & Cameron, 2020)

<sup>22</sup> Both examples were adapted from recent NATO analytic wargames.

<sup>23</sup> A common challenge when conducting wargaming in NATO is that the threat picture is generally also agreed to by the alliance nations, which makes it very predictable for the players.

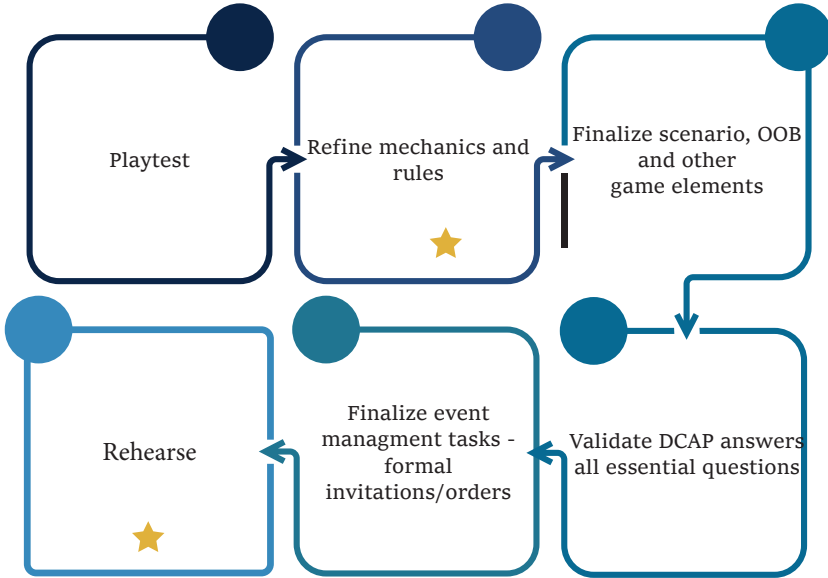
<sup>24</sup> We strongly recommend a face-to-face discussion with the sponsor for this brief. If the actual sponsor will not attend this brief, it is critical that their representative be fully empowered to speak for the sponsor. To facilitate discussion, a good practice is to include a concise read ahead for the sponsor and their staff prior to the brief. If the sponsor does not attend this brief, it is critical that a signed agreement be executed with the sponsor.

<sup>25</sup> There is a movement to use modelling and simulation (M&S) as the adjudication method for wargames, but we must offer a warning and a discussion. In its current state, M&S requires extensive resources to set-up, run, and generate useful data. The focus in a wargame should be on player decisions, not on extremely accurate modeling of combat or other real-world systems. M&S can be valuable in visualization of complex environments or creating trust in the participants, but may be better used as part of the analytic cycle - using the wargame insights to provide input into an M&S facilitated analytic study or vice versa.

<sup>26</sup> The use of the term “visualization” can be daunting, but the most common wargaming visualization method is the use of maps and counters to show players what is going on in addition to the verbal feedback.

# CHAPTER 4 - DEVELOP

*"In preparing for battle, I have always found that plans are useless, but planning is indispensable." - Dwight D. Eisenhower*



**Figure 9: Development Step Detailed Process** ★ Sponsor Touchpoint

**4.1 Development Phase.** Development is all about playtesting and refining the wargame. At a minimum, every wargame should run through a complete playtest of all turns, mechanics, and analysis tools, then have enough time to adjust anything that does not work as anticipated. It is also highly advisable to rehearse the wargame with the execution team at the location and with the same digital footprint as expected at execution if that is an option. For analytic games, it is imperative that the DCAP is tested along with the wargame.

**4.2 Playtesting.** Playtesting is necessary to prevent failure and embarrassment at the wargame execution. Enough time and resources must be allocated for playtesting events and processes. For a more complex wargame, different parts of the wargame can be tested separately, but at least one comprehensive playtest of all of the wargame elements must be conducted. Ideally, at least two full playtests are necessary to make sure that any adjustments made following the initial playtest work properly. If using digital tools for the wargame, these must also be part of the playtest. We list the following as essential to the playtesting regimen.

**1) Geospatial products (the play area):** Make sure that the map or game board covers all necessary areas. For games not requiring a map, it is still important that the play area be well designed and understandable for the players. In addition, the playing space should not be too large - the map or playing board is another piece of information for the players, so the goal is not to confuse the players with extra information that is not helpful. Make sure that the map size is manageable. If the players and facilitators cannot easily access areas that they are expected to play in, that is a problem. Also, the game board or map should be easy to read and understandable, including a clear legend if required.

**2) Game pieces:** Whether the game is manual or digital, the pieces and parts of the wargame that were prototyped in the design phase need to be tested and refined. These can include cards, tokens, adjudication tools, player instructions, etc. The goal is to keep these items as simple and easy to understand as possible. If the wargaming team has access to a graphic design or visualization expert, this resource can be incredibly useful in this phase. Professional-looking and easy-to-understand game elements help establish credibility with the players and sponsors.<sup>27</sup> Resist the urge to use complicated game tokens that the players will not understand.

**3) Mechanics:** All wargame mechanics must be tested to make sure they work as conceived by the wargame designer. This includes the rules governing what players can do each turn, how information is generated and shared, and how the consequences of the actions are adjudicated and captured. Where possible, the mechanics should be streamlined to keep the wargame flowing smoothly. Overly complicated mechanics and rules tend to slow down wargames and create confusion with the players. If complicated mechanics are required by the wargame's subject matter, then it may be necessary to create a layer in the wargame between the players and the mechanics where the player's desired actions are translated by a wargame facilitator into the wargame mechanics. This should be determined during this development phase. It is important to remember that most wargame players are not wargame designers or hobbyists so understanding of complex mechanics should not be assumed.<sup>28</sup>

**4) Timing:** Although this technically falls under the wargame mechanics, testing the timing of the turns in the wargame is critical. Not giving the players enough time is frustrating and may lead to incomplete or poorly thought through actions. Giving the players too much time can lead to boredom and disengagement, so it is vital that playtesters accurately replicate what the players will be asked to do each turn. Also, playtesting the timing of the adjudication is important as well. If the chosen adjudication method requires long pauses where the players are not engaged with

the wargame at all, the risk is that the players will lose interest. This is a particular risk with large tactical wargames executed with complicated systems or simulations. If the wargame team feels that a lengthy adjudication method is required by the wargame, activities that will keep the players engaged during the adjudication should be created by the wargame team<sup>29</sup> or the adjudication can be done in off-hours. One common method for lengthy adjudication processes is to conduct them overnight and report the results to the players the next morning.

**5) DCAP:** The analyst team must participate in the playtesting as well. The DCAP must be tested to ensure that the required data is being generated and that the analysts are able to capture that data. The team might discover that the wargame is not generating enough or the right kind of data in certain areas, or that they don't have sufficient analyst coverage or the correct tools to collect data that the players are generating.

**6) Wargame space:** Understanding whether the wargame has the right spaces for the different player teams and activities is another important part of the playtesting process. There are often requirements to keep teams separate for parts of the wargame and together for other parts of the wargame, so the wargame space is part of the wargame's development. If there is only access to a space that does not support the wargame's mechanics, then the mechanics may need to be adjusted.<sup>30</sup>

**7) IT tools and communication methods:** If the game relies on digital tools, then it is important to playtest them. This can include audio-visual (AV) equipment, network support, knowledge management solutions, chat methods (especially for virtual/distributed wargames), simulation support, and workstation management. Even if the wargame has no digital requirements, it is still important that the players and wargame team can effectively communicate during the wargame. It is hard to conceive of a professional wargame that does not use any digital methods and tools outside of very simple tactical learning wargames.

**4.3 Refine Mechanics and Rules.** It is likely that during the playtesting certain mechanics will not work, information will not be adequate, timing will not be realistic, or a number of other potential issues will arise. A best practice is to record all of the issues during the playtesting as they occur and then refine the rules and mechanics. Playtesting again is recommended if time allows. Some professional wargames will go through several playtests to make sure that the wargame works during execution.

**4.4 Finalize game products and mechanics.** This seems obvious, but at some point, the development process must end and the products, mechanics, and event details must be agreed to and finalized by the wargame team. Remember that no wargame will be perfect, and the timeline agreed to with the sponsor must be adhered to, so the wargame director will need to carefully manage the finalization of all wargame elements by the team.

**4.5 Validate the DCAP:** For analytic wargames, the lead analyst should validate the DCAP's ability to capture all the required data necessary to answer the essential questions. For analytic wargames, the DCAP is one of the most important elements of the wargame, so if the analyst determines that the wargame does not generate and collect all the required data, then hard decisions will need to be made, particularly if the wargame team is out of time to continue developing the wargame. A candid discussion with the sponsor is advisable if the wargame team is unable to create the required data.<sup>31</sup>

**4.6 Finalize Event Management Tasks:** During the development phase, the event management team should finalize all the event management tasks as well as send out a formal invitation<sup>32</sup> that includes detailed administrative instructions. For larger wargames, this will include a registration process for the participants. The simplest rule to use when writing an invitation is to answer the following: what, who, where, when, why, and how. At the very least, the calling message should include the following:

- 1) Name and aim of the wargame
- 2) Dates
- 3) Locations
- 4) Fees
- 5) Registration process
- 6) Required players and expertise from participating organizations
- 7) Security requirements and clearance requirements
- 8) Logistics (lodging, transportation, and dining)
- 9) Points of contact

Again, this handbook is not meant to supplant any organizations formal event management process, only to point out critical areas to focus on for successful wargames.

**4.7 Rehearse:** This is different than the playtest as the wargame mechanics, products, participants, and locations will be finalized at this point. This step in the process bridges the gap

between development and execution of the wargame but is critical for success. It should also involve the sponsor or a representative so that they understand what the wargame execution will look like.

The rehearsal should include the actual team that will execute the wargame at the wargame locations (if possible) and using the intended wargaming tools. The purpose of the rehearsal is to make sure that the team understands the rules, procedures, and mechanics used in the wargame. This should include all of the adjudication, facilitation, analytic, and event support staff. It may require a training period for the execution team to make sure that they fully understand the wargame mechanics.

For some high-level wargames, some of the rehearsals may be an execution of the wargame with lower-level staff members or organizations. These events are unusual in that they combine elements of playtesting, rehearsal, and execution and may be used to generate data for analysis.<sup>33</sup>

---

<sup>27</sup>Some wargame purists may love the small, detailed game tokens typical of hobby wargames, but these can be extremely difficult to understand for the wargame players. There is a science to visualization methods that should not be dismissed by serious wargaming teams. Even simple use of visualization and graphic design methods can yield huge benefits in a wargame.

<sup>28</sup>For very complicated wargaming systems, like the US Marine Corps' Operational Wargame Series (OWS), mastery of the game mechanics can take weeks, which most players will not be able to devote to a wargame. Having facilitators translate the players' intent into actions within the complicated wargame system is critical if this type of system is used. This is also true for most M&S solutions. Having M&S operators input the player actions is a much better option usually than training the players to operate M&S software.

<sup>29</sup>There are many options here, but an easy option is to conduct guided discussions related to the scenario or actions while the adjudication is occurring. It could include discussions on what the players think the adjudication will result in, what alternate actions might have been taken, etc.

<sup>30</sup>The wargame space, whether it is physical or virtual, should match the wargame mechanics. It should be possible to accommodate the different teams and all the players in the chosen space. If the facility or virtual tool has been dictated to the wargame by the sponsor or organization, this must be accounted for in the wargame mechanics. If, for example, the game design calls for the player teams to be separated while planning their turns, but only one large room is allocated to use for the wargame, it will be necessary either to change the game mechanics to accommodate this or to negotiate a better space.

<sup>31</sup>Although this is unfortunate, it does not mean that the wargame is a failure; it probably means that other events may need to be scheduled following the initial wargame. This could be another wargame but could also be one of many other analytic options. The sponsor should be informed of the status promptly. The sponsor will find out regardless, so having an informed discussion as soon as this is discovered is always advisable.

<sup>32</sup>For NATO this is typically a calling message with administrative instructions included as an annex.

<sup>33</sup>For wargames involving high ranking military or civilians, it is a very good idea to run a wargame with subordinate staff or organizations prior to executing with senior leaders. This rehearsal may lead to refinement of the game, and in that sense, it resembles a playtest. It may also be used to generate useable data for the analysis, so in that sense, it represents a full wargame execution.

# CHAPTER 5 - EXECUTE

*“No one starts a war--or rather, no one in his senses ought to do so--without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it.” - Carl von Clausewitz, On War*

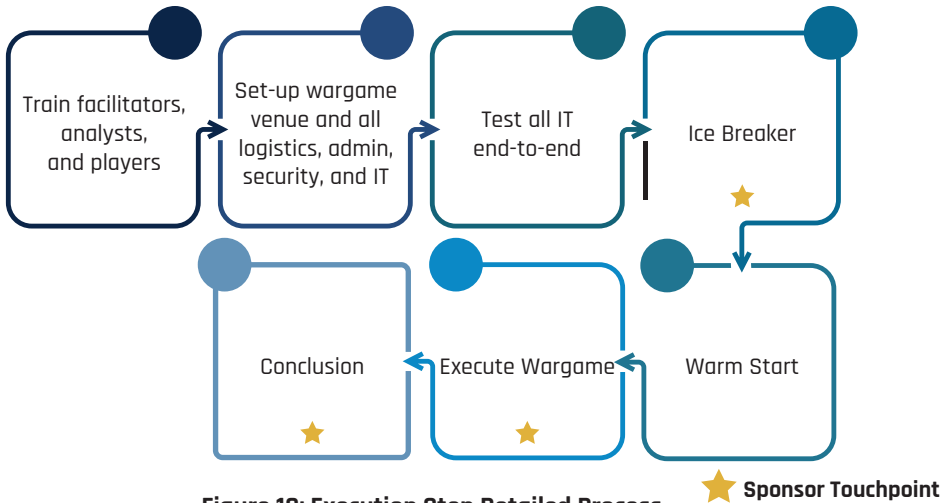


Figure 10: Execution Step Detailed Process

**5.1 Execution.** Execution encompasses all the set-up, training, and running of the wargame. Typically, it will involve more than simply sitting down and playing the wargame, so we offer the following as best practices for executing the wargame.

**5.2 Training.** Most wargames will have a period to get the players, facilitators, adjudicators, and analysts familiar with the scenario, rules, and objectives of the wargame. Each wargame will require different amounts of training time, but enough must be allocated to make sure that everyone understands what is going on in the wargame and what is expected of them as participants. Some of the training can be completed ahead of the execution via read-ahead materials. A best practice is to provide the read-ahead materials between 1-2 weeks before the wargame execution. However, a good assumption for the wargame team is that many players will not fully understand or perhaps even read any read-ahead materials provided. It should not be assumed that players will show up ready to play.

**1) Players:** The players should receive training on the following items:

**a) Player/Team Goals.** The first item that players need to understand is what their team goals are for the wargame. As the most critical element of their training, this will help shape their understanding of the game mechanics and the questions they might have. We strongly recommend making this the first topic of training. Facilitators should verify that the players truly understand what their team goals are for the wargame. Keep in mind that goals can change during the wargame, so if that is part of the wargame design, be sure the players understand that as well.

**b) Background.** Some wargames might call this a 'road to crisis/conflict'; this is the story behind the current situation depicted by the wargame. This should be realistic and believable and should provide enough information for the players to understand the current situation, what decisions they will need to make, and why they are in the current situation. It answers what, who, when, where, why, and how of the current situation, which is a good method to develop an effective background story for the wargame. For wargames examining real world situations, there is no creation necessary, just effectively conveying relevant information to the players.

**c) Wargame mechanics.** Players need to understand what they can do each turn, what they can't do, and how they will indicate to the wargame team what their move is. They should also understand how the consequences for their moves will be determined and how they will receive feedback about those consequences.

**d) Wargame timings and agenda.** Players need to understand the timing of the wargame turns and the daily agenda of turns, plus events related to the wargame. This can include administrative and social items as well.

**e) Communications.** Players should be taught how to communicate with other players, facilitators, and adjudicators, how to pose questions or requests for information, how to access reference materials, and how to store working documents - physical or digital. The proper flow of information in a wargame can be challenging, so the players need to understand the system that the wargame team has established for smooth and effective communication during the wargame. If the wargame relies on different teams communicating with one another, don't assume that it will happen without a well-defined method to do so that is clearly explained to the players and facilitators.

**2) Facilitators/adjudicators:** The facilitators and adjudicators for the wargame may not



have been part of the wargame design and development, so if using outside experts to assist with the wargame execution, they also need training. They will need much of the same training as the players, but with less emphasis on the scenario and more emphasis on the mechanics, timing, and communications elements of the wargame. It is highly recommended to not use inexperienced wargamers to fill the facilitation and adjudication roles. They should have previously participated not only as players in wargames, but also have practiced a few times as facilitators and adjudicators before attempting to facilitate or adjudicate a wargame. If using a very complex wargame system, the facilitators will need additional training in that system, as the players will very likely not understand the system completely. Caution should be taken to avoid imbalances between teams if the facilitators have different levels of understanding of the wargame mechanics.

**3) Analysts:** The analysts need to understand the wargame scenario and rules well enough for completing the collection outlined in the DCAP. In addition to the essentials of the wargame itself, analysts should receive training from the lead analyst that covers the following areas:

**a) DCAP.** The analysts need to understand the wargame's aim, objectives, and the questions that data collection is supporting. The DCAP should cover not only what questions are being asked to collect relevant data, but how the analysts will be collecting the data (i.e., the methods to collect all the data needed to meet the sponsor's objectives for the wargame).

**b) Where, how, and when they will collect data.** Part of the analyst training is knowing where they will need to be during the wargame to effectively collect the data from the players. They also need to understand the mechanics of the wargame well enough to know when decisions and deliberations will occur and how they will be able to access this. It can be as simple as taking notes on player deliberations, but can be much more complicated, like receiving detailed combat adjudication results from a simulation. Chapter six contains additional information on analysis.<sup>34</sup>

**5.2 Set-Up:** The wargame teams should have adequate time to set-up the venue and tools. Ideally, everything will be set-up and tested prior to the players' arrival. Set-up includes not only the wargame set-up itself, but also all the event management apparatus as well - transportation, security, registration and check in, dining and refreshment arrangements, and all the information technology (IT) networks and tools that will be used during the event. For

some events, the IT set-up and testing can take a substantial amount of time and personnel, particularly if modelling and simulation are being used in the wargame.

**5.3 End-to-End IT Testing:** If the wargame relies on digital tools and infrastructure, it is critical to test all of it, end-to-end, prior to the warm start. All systems and software should be tested, every network connection should be verified, visualization tools like displays and projectors should be tested, and distribution and communications tools must be verified at all locations. Having qualified IT professionals on hand with the proper access to all systems and networks is highly recommended.

**5.4 Ice Breaker:** Wargames are generally social events, and it is a good idea to make sure that the players and wargame team are comfortable with each other prior to the wargame's start. This does not require a social event in the evening or a dinner but can simply be a fun activity prior to the start of the wargame that lessens nerves, allows the players and wargame team to interact with one another before the pressure starts, and generally introduces everyone to each other. This is optional, but recommended, particularly for larger wargames or if the players have not worked with one another before. For distributed wargaming, this may require a little more creativity on the wargame team's part.

**5.5 Wargame "warm start":** It is a very good practice to play through a complete "warm-up" turn (often termed 'turn zero') with all the players and wargame team, generally with a less challenging vignette to give everyone an idea of how the wargame will flow, how actions will be conducted, how adjudication will occur, etc. It is highly recommended that this step be worked into the execution timeline.

**5.6 Execution Management:** Many well-designed wargames fail to meet all their objectives because they were not well managed during the wargame execution. Each member of the wargaming team has a role to play to keep the wargame on track to reach all the wargame objectives.

**1) Wargame Director:** The wargame director has the overall management responsibility for the wargame. He/she must be able to not only ensure that the game's timing and mechanics are followed, but also manage all the distractions that can cause a wargame to go off course. Examples of outside influences that may impact the wargame include, administrative and IT issues, uncooperative participants, and overlong discussions, to name a few. The game director ideally should not be conducting any other roles during the wargame, to include adjudication, analysis, administration, etc. All these roles should be reporting to the wargame director.<sup>35</sup>

**2) Facilitators:** The facilitators should be primarily focused on making sure that the players are completing their turns on-time according to the game design (mechanics, input data, team goals, etc). They should be able to answer player questions on rules and agendas, where to find information, how to complete turns, and communicate with other participants. They should not insert their opinions and become players themselves. The game director needs to carefully monitor facilitators to make sure that they are not 'steering' the players to make certain decisions. Even if the facilitator 'knows' that the player is making the wrong decision, they must resist influencing a valid action by the players.

**3) Adjudicators:** Whatever adjudication tool the wargame is using, the adjudication team must ensure that the adjudication is timely, complete, and properly communicated back to the players. If adjudication is taking longer than anticipated, the adjudicators must work with the wargame director to find a solution that is credible and will still meet the wargame's objectives. It is not a bad idea to have a back-up adjudication plan available (for example, if an M&S adjudication solution is taking too long or stops working, having manual adjudication tables available or an expert who can make sound adjudication judgements prepared for such a contingency is a good idea).

**4) Analysts:** A good analyst team will largely go unnoticed by the players (unless they are meant to interact with the players through questions and surveys) and should be sufficiently resourced in an analytic wargame to collect the data without the need to stop the wargame. They also need to communicate frequently to the game director on whether all of the necessary data to complete the DCAP is being generated and collected. If it is not, they need to confer with the director on how to move forward so that all objectives can be met.

**5.7 Players make the decisions:** Remember that the players are the ones making the decisions based on their best judgement. It is imperative that the wargame facilitation team not try to influence the player decisions other than making sure that the decisions are within the wargame's rules and parameters. The wargame director must insure that none of the facilitators, adjudicators, analysts, or observers are trying to substantively influence player decisions

### ***Only players get to make decisions in the wargame!***

**5.7 Wargame conclusion:** Generally, the execution will conclude with items that will be critical for the last phase of the wargame cycle: the analysis and reporting. We specifically mention the following items that should be completed before the wargame participants are released.

**1) Hot-wash:** A hot-wash is a final, facilitated discussion that can cover many items, but the more useful aspects to discuss are the following:

**a) Insights gained:** Insights gained by the players or wargame team into the wargame's stated objectives are invaluable at the end of the wargame. These should be captured and included in any post-game analysis and reporting.

**b) Things that need further analysis:** If interesting questions arose during the wargame that fell outside of the stated aim and objectives but are still valuable and in need of further analysis, those should be captured as well both during the wargame and in the conclusion.

**c) Lessons learned:** This can include lessons learned by the players and participants but also observations about the game format and mechanics, both good and bad. Discussions on the wargame itself should not be the focus of the hot wash as it does not contribute to the aim and objectives of the current wargame, but can be useful for future wargames. This could be executed with an exit survey as well.

**2) Exit survey:** Every analytic wargame (and possibly learning wargames as well) should include an exit survey that serves as the final chance for the analysts and wargame team to collect data needed to answer all the essential questions contained in the DCAP. It also allows less vocal or introverted players to offer insights than can be quite valuable. The DCAP may even rely on an exit survey by design.<sup>36</sup>

---

<sup>34</sup>Make sure the players understand that there will be analysts present when they are deliberating. Introduce the analysts to the players early and include them in any ice-breaking activities.

<sup>35</sup>One of the most critical duties of the wargame director is to prevent non-wargame participants from disrupting the wargame. Some wargames are disrupted or even ruined when a senior leader has a good idea of how to change the wargame during execution despite months of planning and preparation. A critical skill for the wargame director is being able to manage senior leader interactions with the wargame and wargame team. If the senior leader cannot be dissuaded, then the wargame director must do their best to salvage the wargame objectives.

<sup>36</sup>For wargames that rely on discussion by the player teams, it is important to conduct a written exit survey to allow less vocal or forceful players to express what may be valuable insights into the problem that the wargame was examining. This is especially true in multinational player teams where native speakers may dominate the discussions. Allow adequate time for the exit survey in your wargame plan.

# CHAPTER 6 - ANALYSE AND REPORT

*"I have not failed. I have found 10,000 ways that don't work." - Thomas Edison*



Figure 11: Analysis and Reporting Step Detailed Process ★ Sponsor Touchpoint

**6.1 Post Wargame Analysis:** The wargame process is not complete with the final turn of the players. Analysis of the wargame and the players' decisions is equally important as the wargame execution. Even learning wargames require analysis of how well the players understood and applied the topics explored in the wargame. For analytic wargames, there can be several steps and products to deliver that the sponsor requires from the wargame, which were identified in the initial scoping session(s). Every wargame will be different, so the deliverables for each wargame will be different as well. We offer the following as examples of deliverables:

**1) Hot-Wash:** As presented in the previous chapter, the first post-wargame deliverable is generally a hot-wash facilitated by the wargame team. Often the sponsor will be present for this session to receive the initial impressions from the players and wargame team. This is also typically a data collection method for the DCAP, so the lead analyst should be consulted when organizing the topics for the hot wash.

**2) Formal After Action Review (AAR):** Some wargame sponsors may request a more

formal AAR following the wargame. The timeline and structure should be agreed to by the sponsor and wargame team prior to the wargame. If specific players or wargame team members are required for the AAR, arrangements should be made beforehand as this typically will require some time to create. Typically a formal AAR will include:

- a) an assessment of key findings,
- b) how well the wargame met the aim and objectives, and
- c) a discussion of follow-on products, events, and analytics that will use the wargame's findings.

**3) Quick Report:** For wargames that will produce a lengthy formal report, a quick report can serve as a useful initial product for ongoing analysis and can serve as a draft product for review and use in the final report. This will cover the same elements as the AAR but will also include a discussion on the genesis of the wargame, methodology used to create and execute the wargame, and any other elements deemed essential by the wargame sponsor.

**4) Formal Presentation of Wargame Findings with Sponsor:** This will typically be a meeting between the wargame team and the sponsor during which the requested findings are formally presented to the sponsor and may include a discussion of the final wargame report and follow-on actions. For smaller and less formal wargames, this can be combined with the AAR.

**5) Internal Assessment:** The wargame team should conduct an internal assessment of the wargame's effectiveness. Topics to consider include the wargame mechanics and rules, the scenario, flow and pace of the wargame, the DCAP, event management, and sponsor interaction. This may include a brief to the wargame teams' leadership separate from the briefs to the sponsor. Assessment should be candid and professional and shared with other wargaming professionals.

**6) Final Report:** If requested, a more formal wargame report can be produced. This will typically be reviewed by the wargame team, the sponsor, and for more formal processes, other stakeholders, and subject matter experts. The report should be written with the follow-on uses of the wargame findings as the central focus of the report.

**7) Knowledge Management:** Unless requested by the sponsor, the wargame's findings should be properly stored, organized, and available for appropriate users, following knowledge management best practices. The wargame design methodology and internal assessments should also be stored, organized, and available for other wargaming professionals to use in their wargames.

**8) Incorporate Wargame Findings:** The wargame's findings and products are only useful if they are used. This is true for both analytic and learning wargames. The wargame team should follow-up with other groups or individuals using the wargame's findings and provide any clarification or reasoning that may not have been covered in products that the follow-on groups received. It should be remembered that wargames are rarely, if ever, the culminating event in any process. Generally, learning wargames will deliver insights into areas that may need additional training or education. They can also generate insights that may warrant follow-on analysis.

**6.5 Post-Game Analysis:** After a wargame is over, the analyst team should collect all the information and process it systematically. Exactly how this is done varies from game to game, but common elements include:

**1) Statement of whether the wargame aim and objectives were achieved** (or not), with supporting evidence.

**2) Key themes** that arose during the wargame, with relevant details and insights. A useful framework to follow is known as ODCR:

**a) Observation** (what was observed in the game, what actions were taken)

**b) Discussion** (additional details such as the context, what was happening at the time, what factors went into the decision, what were the consequences, etc)

**c) Conclusion** (why is this important, how is it relevant to the overall problem)

**d) Recommendation** (any recommendations for change because of the conclusion.)

**3) Visualizations** (e.g., decision trees showing common decision-action-consequences, or a graph showing changes in player perceptions throughout the game).

**4) Recommendations for further analysis** (e.g., actions from the wargame should be run through a simulation model to test for feasibility).

**5) Critique of the game design** to demonstrate level of confidence of findings and lessons for future games.

The post-game analysis will be recorded in the wargame report.



# CHAPTER 7 - DIGITAL TOOLS AND DISTRIBUTION

*“It is customary to offer a grain of comfort, in the form of a statement that some peculiarly human characteristic could never be imitated by a machine. I cannot offer any such comfort, for I believe that no such bounds can be set.”*

*- Alan Turing*

**7.1 Comprehensively covering how digital tools can support and enhance wargaming would be challenging.** The tools and technology are constantly evolving, and NATO has a capability programme currently in progress to develop digital tools for wargaming.<sup>37</sup> It is important to note that digital tools are not required for wargames, and the team should carefully consider their use. The tools should only be used if they add value to the wargame outcomes.<sup>38</sup> Broadly, digital tools can be used in a wargame for the following five purposes:

**1) Planning:** This is by far the most common use of digital tools in wargames. This can be as simple as a spreadsheet to manage inject timings or the DCAP but can be more comprehensive tools that incorporate all elements of the wargame design.

**2) Visualization:** Digital visualization tools are digital methods to provide players with the situational awareness needed to make informed decisions. They can include digital maps displaying forces, digital graphs and charts to more clearly present complex data sets, or simulated media products. Their use can significantly enhance player awareness of the scenario and ongoing narrative of each wargame if they are correctly set up and managed. They should only be used if they add value to the wargame. A physical map can be just as effective as a digital map and, in many cases, will be easier to manage - carefully consider your tools and their cost/benefit to your event.

**3) Adjudication:** Broadly, digital adjudication comes in two varieties. The first and simplest digital adjudication tool is digitising adjudication tables and probability rolls. Rather than roll dice or use manual tables, spreadsheets or other devices with probability rolls, pre-programmed tables can significantly speed up the adjudication of player actions. Again, this type of tool must be carefully considered, and the adjudication team must clearly understand its use.

The second type of digital adjudication is much more involved and requires substantial

resources, both to set up before the wargame and also to run during the wargame. That is the use of simulations. Simulations can add significant realism and trust to the wargame and its results, but this must be carefully weighed with the substantial time and resources required to utilize them as adjudication tools during the wargame properly. It may be more beneficial to execute the wargame and then run the results through a simulation after the game to generate more detailed data from the player's decisions. At the time of writing, NATO does not have simulations that are easily adaptable for use during a wargame,<sup>39</sup> and we must strongly caution wargame teams to consider whether to use a simulation during their wargame.<sup>40</sup>

**4) Distribution:** Because wargames rely on player interactions, having players and the wargaming team interact in person is usually much more effective. However, there may be situations in which in-person wargaming is not feasible or desirable, and proper use of digital tools will be required. Distributed wargaming has an added advantage in that it allows for asynchronous play. Turn lengths can be substantially extended in distributed wargames as there is not the same pressure to finish the wargame as you have when all the players are playing in person. It is generally easier to maintain situational awareness in person with facilitators physically located with the players, so care must be taken to ensure that the players still maintain proper awareness of their and the other player teams' actions, that they understand the inputs required for their turns, and that they meet the time constraints as are necessary for the wargames completion. The recent COVID pandemic made digital meeting tools much more accessible, providing a reasonable method to run synchronous wargames. For longer wargames, turns can be played by e-mail or over collaborative shared web tools. Classified wargames can be more challenging to run distributed due to the lack of approved collaboration tools useable on NATO classified networks.

**5) Analysis:** Much of a wargame analysis will be captured using digital spreadsheets and documents. Still, more robust analytic tools may be used to manage, visualize, and present analytical findings from wargames. It can also be helpful, where allowed, to record portions of the wargame for later playback and analysis. This can be video, shared web spaces, digital chat histories, or simulation playbacks.



<sup>37</sup>Next Generation Modeling and Simulation Capability Programme specifically looks for digital tools to design, execute, and analyze wargames as part of a more extensive training and analytic digital package. It should have an initial operating capability in 2025.

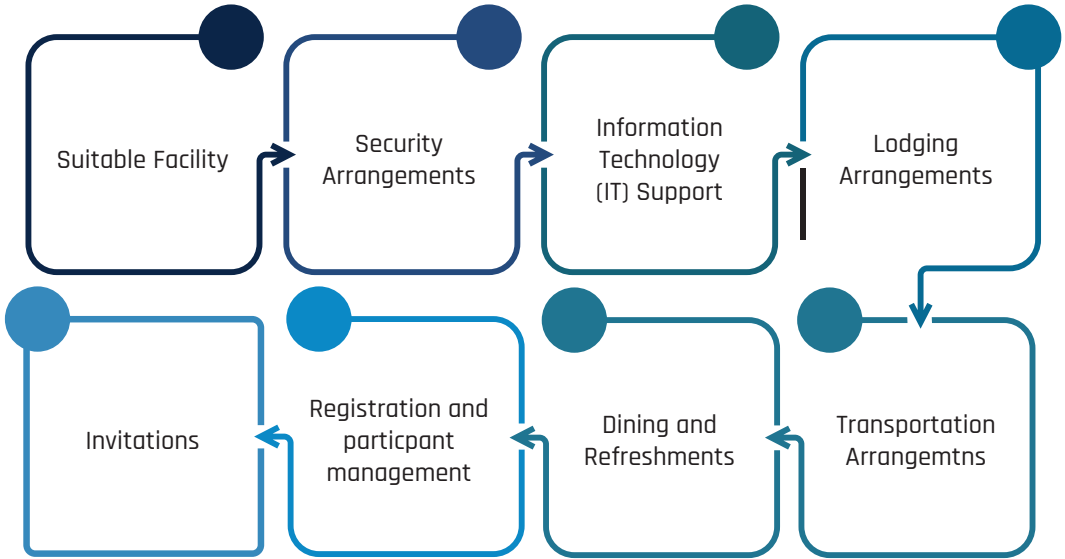
<sup>38</sup>There is a tendency to want to run wargames using simulations without considering whether the simulations will support the wargames' aim and objectives or add unnecessary complexity to the wargame. The wargame director may need to have very frank discussions with the sponsor about simulation use if it is optional to meet its aim.

<sup>39</sup>ACT's Next-Gen M&S Programme is tasked with developing tools that are much less resource intensive, more intuitive, and more interoperable than current-generation tools. Still, those will not be available until 2025 at the earliest.

<sup>40</sup>Some potent analytic tools will use advanced algorithms to simulate player decisions in simulations. While these can offer substantial data, they are not wargames. Ideally, player decisions in a war game can feed these powerful analytic tools as part of a broader analytical study.

# CHAPTER 8 - EVENT MANAGEMENT

*“A hungry man can’t see right or wrong. He just sees food.” - Pearl S. Buck*



**Figure 12: Event Management Detailed Process**

**7.1 Event Management:** It is useful to think of the preparation and delivery of a wargame as two equally important and complementary parts. The first part is the wargame itself with all its mechanics, scenario, and analysis; the second part consists of the events that will generate the planning and execution of the wargame. Poorly managed events will ruin otherwise good wargames. Therefore, having a dedicated event management team is important for success. Event management must be included in the wargame planning from the very beginning of the process. We offer the following wargaming specific considerations of event management, recognizing that every organization has their own event management procedures. We encourage every wargame team to consider the following as they plan the wargame planning and execution events:

- 1) Suitable Facility.** The space must be large enough to accommodate all the wargame’s activities and participants. Each team in a wargame, to include the team

running the wargame, will need a separate space to meet and deliberate. The facility should be accessible by all the desired participants. It also should be convenient for the participants, particularly if there are very busy or high-ranking participants. Having a great facility in a very remote location can be problematic. For longer wargames, participants and team members must be able to take breaks in suitable break areas.

**2) Security Arrangements.** This covers many separate areas that may require different expertise. Information, physical, operational, and network security are all important considerations for wargaming events.

**a) Information Security:** If running a classified event, the facility must support this. Many games run by and for NATO will be classified and therefore unable to be run in most civilian facilities. Methods for verifying participants' security clearances must also be arranged well in advance. Likewise, methods to properly handle and dispose of classified materials must be part of the event planning process.

**b) Physical Security:** If the facilities have their own security personnel and procedures, coordination with them is needed to ensure all aspects of the event comply with relevant security rules. If their personnel or procedures are inadequate, it will be necessary to either arrange for additional security or find a different facility.

**3) Information Technology (IT) support.** Many wargames, particularly larger wargames, will need digital support that can include workstations, digital storage of materials, visualization aides, distribution to remote participants, adjudication support (which includes simulations) and a variety of other digital tools. Arranging for this early on is critical. If some digital tools are not available or supportable, then the wargame design will need to be altered. Someone qualified must be available to troubleshoot and maintain any digital tools used during execution.

**4) Lodging and transportation.** If participants are coming from other locations, they will need to have lodging, transportation, and access to dining. To ensure that they can participate, the wargame team should help manage this process and publish understandable and realistic administrative instructions. If the facility chosen has no lodging accommodations nearby, transportation will need to be arranged. If the location has no affordable lodging, participants will need assistance with lodging (or choose another location). The range of lodging allowances within NATO is quite substantial, so this should be considered. It should be remembered that, for many

locations, rental or personal transportation will not be authorized by participants' sponsoring organizations or may not be practical in the wargame locale.

**5) Dining and refreshments.** As participants need to eat, for most wargames lunch will need to be factored into the schedule and arrangements. If the organization allows it, it can be a good practice to arrange for working lunches so that participants do not leave the wargame location. Having coffee, tea, water, and light snacks for break periods can also be very beneficial to keeping participants focused and happy. Breaks are important; however, the length and frequency of breaks must be strictly enforced to keep the wargame running properly. The wargame team should remind the participants that discussions over breaks and meals should be kept at appropriate classification levels for the location.

**6) Registration.** For larger events, a system to register and keep track of wargame participants should be used. This system should also be arranged early in the process to make sure that the wargame will have the right participants during execution and that all necessary administrative actions are completed for each participant prior to execution.

**7) Invitations.** For smaller, less formal games, this can be a simple e-mail invite to the required participants; for larger or more formal wargames, the invitation process can be quite involved and may need to follow strict procedures. Understanding the proper way to invite participants is important in NATO – improper invitations might mean that desired participants will not be able to participate at all, as travel funding and approval is often tied to formal invitation procedures. All invitations should include the following, regardless of their formality:

- a) Name and aim of the wargame
- b) Dates
- c) Locations
- d) Fees
- e) Registration process
- f) Required players and expertise from participating organizations
- g) Security requirements and clearance requirements
- h) Logistics (lodging, transportation, and dining)
- i) Points of contact

**8) Other considerations.** Every event will have different requirements, but some other elements that may apply to an event can include public affairs office (PAO) support, messaging, formal tasking and routing procedures, distinguished visitor management, protocol, and many others.



# REFERENCES

- Appleget, J., Burks, R., & Cameron, F. (2020). *The Craft of Wargaming*. Annapolis: Naval Institute Press.
- Bryan, R., Mouat, T., & Fisher, T. (2023, 02 27). *Matrix Game Construction Kit*. Retrieved from PaxSims:  
<https://paxsims.wordpress.com/magck/>
- Caffrey, M. B. (2019). *On Wargaming*. Newport: US Naval War College.
- Development, Concepts and Doctrine Centre. (2017). *United Kingdom Ministry of Defence Wargaming Handbook*. Shrivenham: Development, Concepts and Doctrine Centre.
- Longley-Brown, G. ( 2019). *Successful Professional Wargames A Practitioner's Handbook*. Bristol: The History of Wargaming Project.
- Perla, P. (2011). *The Art of Wargaming*. Annapolis: United States Naval Institute.
- Polski, M., & Logel, J. (2019). *Doing Analysis*. Newport, RI: U.S. Naval War College War Gaming Department.
- Polski, M., & Logel, J. (2019). *Doing Analysis*. Newport: U.S. Naval War College War Gaming Department.
- Pournelle, P. E. (2017, June). *Designing Wargames for the Analytic Purpose*. *Phalanx*, 50(2), 48-53.  
Retrieved July 6, 2023, from <https://www.jstor.org/stable/26296384>
- UK Ministry of Defence. (2023). *Influence Wargaming Handbook*. London: UK Ministry of Defence.  
Retrieved from [www.gov.uk/mod/dcdc](http://www.gov.uk/mod/dcdc)















# CONTACT US

If you have any questions or concerns about this handbook, the NATO Wargaming Capability Development Programme or NATO Wargame Training Programmes, or you simply want to become a part of our community of interest, please contact us at [SACTAW@act.nato.int](mailto:SACTAW@act.nato.int) or call LTC Aaron Beam at +1 757 747 3785.

For inquiries about the NATO Wargaming Programme of Work, please contact Caroline Leichtnam at [caroline.leichtnam@act.nato.int](mailto:caroline.leichtnam@act.nato.int) or +1 757 747 3661.





	<p>NATO + OTAN</p>
<p><b>Allied Command Transformation</b></p>	
<p>Norfolk, Virginia   USA</p>	

