

Wargaming the Complex Battlespace

Rethinking Targeting for Multi-Domain Operations

By Mr Adam T. Jux, BA Civilian Targeting Consultant

By Dr Christopher J. Morris, PhD Civilian Wargaming Contractor



Introduction

Targeting is central to offensive military operations. NATO's Allied Joint Doctrine for Joint Targeting (AJP-3.9) states that joint targeting links tactical actions to operational and strategic objectives.¹ Contemporary Air Domain targeting must cope with adaptive adversary systems and networks in which kinetic and non-kinetic effects interact in non-linear ways. Models inherited from earlier conflicts are increasingly inadequate when confronted with the realities of the

modern battlespace, which is congested, cluttered, contested, connected and constrained.² To address this complexity, NATO should adopt analytical wargaming as a permanent learning cycle. This would allow planners to test targeting hypotheses in a 'safe-to-fail' environment, ensuring that proven decision logic informs future doctrine and operational planning.

The ongoing conflicts in Ukraine and the Middle East illustrate how legacy targeting models struggle against complex adaptive systems. In Ukraine, relatively modest

capabilities, integrated into a software-defined architecture, have repeatedly frustrated a numerically superior adversary.³ By dispersing mobile ground-based air defence systems and leveraging commercial ISR, Ukrainian forces successfully complicated the Russian targeting cycle, proving that success depends less on platform superiority than on the speed of tactical adaptation.⁴ This outcome is not solely attributable to Western-supplied weapons systems, but to how Ukraine adapted its Tactics, Techniques, and Procedures (TTPs).

'In theory there is no difference between theory and practice. In practice, there is.'

Jan L. A. van de Snepscheut

Operations against the Iran-aligned Houthi movement, Ansar Allah, a non-state armed group in Yemen, present a different targeting challenge and demonstrates the limits of conventional deterrence.⁵ As a decentralised non-state actor, the Houthis leverage transnational support networks and operate within civilian populations to insulate themselves from traditional strikes. This asymmetric 'Red Sea Model' shows that Western advantages in precision munitions are often negated by an adversary's ability to absorb high-end kinetic effects while maintaining persistent maritime disruption. NATO currently lacks a 'safe-to-fail' environment in which to analyse how isolated tactical decisions reverberate across a long-term campaign. Analytical wargaming provides that space, allowing practitioners to explore second-order effects before a single mission is launched.

Wargaming as an Analytical Framework

Wargaming offers a powerful tool for analysing complex systems and can help reveal how behaviours and external factors can influence outcomes rather than predict them. In NATO usage, a wargame is a decision-centric simulation in which players act under friction and receive feedback, conducted either for learning or

analysis.⁶ NATO doctrine addresses the use of wargaming in Allied Joint Publication, AJP-5, as a means for conducting course of action (COA) analysis and evaluating decision points for branches and sequels. While COA wargaming is the most familiar doctrinal application, it represents only one point on a wider spectrum of wargaming practice. Wargaming can be leveraged at each – strategic, operational, and tactical – echelon and across time horizons, from fight tonight and COA analysis to long-range force development and concept testing decades into the future.

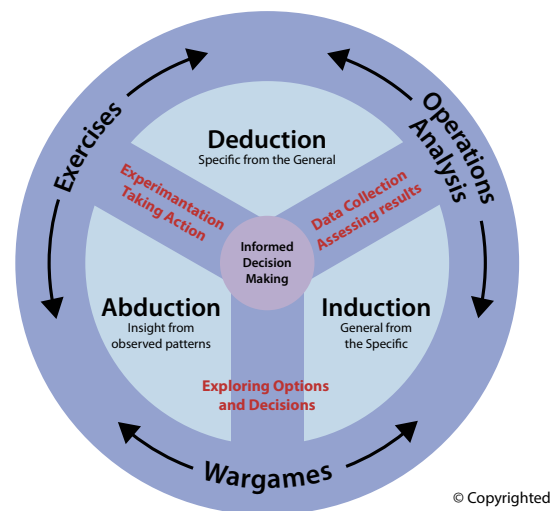


Figure 1: Adapted from Perla, 'The Art of Wargaming'

Professional military wargaming provides a means to iterate processes or functions to develop a clearer understanding of potential outcomes and to inform plans, TTPs, and doctrine. Peter Perla's Cycle of Research proposes that wargaming, exercises, and operations analysis should function in a continuous cycle, incorporating real-world operations and historical data, to help the national security community understand real world events.⁷ This cyclic nature is important because it positions wargaming as part of an organisational learning system, rather than merely an event.

Wargaming is dependent on human decision-making. Its distinctive value is data derived from how participants perceive, choose, and adapt under constraints. This human element distinguishes wargaming from quantitatively focused modelling and

simulation, where the decision is removed and attention shifts to a range of outcomes derived from a given set of variables.

Some wargame designs incorporate probabilities, data, and structured adjudication to inform outcomes. Others rely primarily on facilitated discussion and expert judgement to surface assumptions and generate qualitative insights. In both cases, the decisive mechanism is the same: the human participant is the agent that creates the game's most important data, decisions made under friction and the reasoning behind them.

Unfortunately, NATO targeting has not yet fully exploited this spectrum, tending to treat wargaming primarily as a training event rather than as a repeatable research method that produces transferable insight for doctrine and planning.

From COA Analysis to Informing Experience

In analytical wargames, human players are a critical input used to explore hypotheses and capture decision logic. In educational wargames, the human experience is the intended output, shaping understanding and professional judgement. Wargaming provides a safe-to-fail environment that allows participants to encounter friction, to test bold strategies, challenge assumptions, and explore unconventional approaches without professional and existential risk.⁸ Less constrained by resources and operational limitations, wargame designers can manipulate time and space to expand the depth of analysis. A months-long campaign can be examined in days, and a single targeting cycle can be drawn out over a week of gameplay, executed from virtually anywhere.

Learning objectives can tailor the focus of the event, and adversary perspectives can move beyond dogmatic generalisations and be examined in detail. Critically, the value lies not only in what happened in the game, but why players made the choices they did. When analytical wargames are treated as learning tools, outcomes should drive discussion and

assessment rather than recrimination, building institutional knowledge about system behaviour, cascading effects, and adaptive responses that persist beyond individual participants.

These benefits are not automatic. They depend on design quality and appropriate interpretation. A deliberate design process differentiates professional military wargaming from ad hoc COA analysis or tabletop mission rehearsal. The methods dictate the outcomes. Adjudication rules and player behaviour can produce vastly different results from the same scenario. Conversely, haphazard assumptions and inputs from the facilitation and adjudication team can shift a wargame into the realm of fantasy.

Most importantly, wargame outcomes can mislead if treated as predictive tools. Biases and classification constraints can hinder the friction inputs, and resource-intensive games are difficult to repeat regularly. Due to the human and decision-centric nature of wargaming, it is impractical to assume representative sample sizes capable of producing predictive or probabilistic conclusions. Wargaming complements, rather than replaces, other analytical tools such as modelling and simulation and field exercises. Each method should be selected to match the question being asked.

NATO Wargaming for MDO Targeting

Methodological framing becomes more urgent as NATO attempts to operate in a genuinely multi-domain environment. NATO seeks to become a Multi-Domain Operations (MDO) enabled force by 2030, but the concept remains unevenly understood across the Alliance. MDO is not limited to the five conventional domains of Air, Land, Maritime, Space, and Cyber. It also involves non-lethal instruments and wider governmental and societal influences that shape strategic outcomes. Expanding wargaming to incorporate non-lethal and cross-domain targeting considerations would better align analytical learning with NATO's MDO ambitions.⁹

Integrating MDO-type targeting into wargaming presents distinct analytical challenges across targeting types. Non-lethal targeting, dynamic targeting, and



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deliberate targeting each require different game design parameters to assess effectiveness. For instance, a matrix wargame is an argument-based tabletop simulation governed by discussion rather than complex rules. It can explore the integration of non-lethal effects alongside kinetic operations and examine trade-offs, sequencing, and unintended interactions. At the military-strategic level, campaign-length wargames can explore how targeting strategies interact with political objectives, alliance dynamics, and adversary grand strategy. Here, second- and third-order effects, such as escalation risk, legitimacy, alliance cohesion, and freedom of action, become central to the targeting problem.

Unlike most exercises, strategic wargames prioritise decision-making under uncertainty over tactical proficiency. Because political objectives and constraints govern military action, targeting must account for where lethal operations and non-lethal effects – economic, political, and informational – interact or conflict. Military action must either complement the effects sought at the political level or, at minimum, avoid undermining them. It is inefficient, for example, to invest in Signals Intelligence (SIGINT) collection against a facility only to conduct a lethal strike the next day, unless this strike resulted from an MDO-informed effects logic and sequencing plan.

Wargaming Application Across Echelons

Educational wargaming remains common at the operational level, primarily to teach concepts, foster critical thinking, and strengthen decision-making skills. However, operational- and strategic-level wargaming increasingly emphasise analytical applications that generate data and explore broader questions of doctrine, capability, and force structure.¹⁰ Embedding wargaming within the institutional learning cycle, thereby creating feedback loops between operational experience and doctrinal development, should be treated as a concrete institutional objective, not merely an aspiration.

This institutional approach matters because it clarifies what NATO seeks from the activity: learning outcomes, analytical findings, or both. Current analytical wargames can focus on specific hypotheses concerning targeting effectiveness, adversary behaviour, or system performance, with results feeding into doctrine development and operational planning cycles. Over time, this would create an empirical foundation for understanding targeting in complex environments and help characterise and manage uncertainty that emerging technologies and evolving adversary behaviours create. Across the military-strategic, operational, and tactical echelons, analytical applications serve different



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purposes and should be deliberately programmed and linked with the appropriate audiences.

At the military-strategic level, campaign wargames explore how targeting strategies across multiple Joint Operational Areas (JOAs) interact with political objectives, alliance dynamics, and adversary grand strategies. The focus at this level is on commander decision-making dilemmas rather than tactical proficiency or training outcomes. Human judgement remains central, but AI-enabled tools may support strategic-level wargaming by improving data capture and expanding the decision spaces available for analysis.

Operational-level wargames should analyse system-level interactions and build shared understanding of the targeting process. Operational staffs can test specific targeting challenges within limited, defined scenarios. These might focus on counter-air operations in contested environments, interdiction campaigns against adaptive networks, or close air support in urban terrain. The emphasis is to understand how targeting systems

support prioritisation of targets and the achievement of an end state rather than training individual skills.

At the tactical level, wargaming explores decision-making challenges within the targeting process. These may examine sensor-to-shooter timelines in dynamic environments, the effectiveness of different munitions against adaptive targets, or coordination challenges between manned and unmanned platforms. While wargames can explore decision logic, designers should tightly scope technically adjudicated elements and, where necessary, pair with modelling and simulation or validated data.

Specialist analytical wargaming would first explore how targeting processes can adapt and evolve. Designers should use targeting experts in deliberate, dynamic, and non-lethal targeting to shape wargame development. The findings would then inform educational wargaming incorporated into exercises by translating findings into teachable decision patterns, planning norms, and scenario injects. In turn, this would

inform training design tailored to the echelon and audience, each with distinct authorities, responsibilities, and measures of effectiveness. This institutional 'analysis-to-education' pipeline is particularly important as emerging capabilities complicate targeting by compressing time, expanding target sets, and increasing cross-domain interaction effects, conditions that render linear targeting models increasingly brittle.

Recommendations for Integrating Targeting into Wargaming

To operationalise the analytical benefits of wargaming, NATO must move beyond recognising challenges and towards institutional solutions. The following recommendations provide a framework for integrating wargaming into the NATO targeting enterprise:

1. Leverage the Distributed Synthetic Training (DST) Initiative. The October 2024 launch and subsequent October 2025 Memorandum of Understanding (MoU) for the DST initiative provide the ideal technical architecture for analytical wargaming. Rather than building isolated 'wargaming rooms', NATO should use the DST framework to federate national wargaming efforts. This allows for high-fidelity, cross-domain targeting scenarios to be executed virtually across Allied borders, mitigating the physical and resource constraints of traditional tabletop exercises.
2. Identify a network of organisations as the lead centres for 'Synthetic Targeting' efforts. To address manning and expertise gaps, NATO should designate specific hubs to lead targeting wargaming development. JAPCC should serve as the conceptual lead for Air-Domain analytical wargaming, while the Joint Warfare Centre (JWC) in Norway and the Joint Force Training Centre (JFTC) in Poland should be empowered to host and adjudicate campaign-level targeting wargames. These centres should act as the 'repository of decision logic', ensuring that lessons learned in one exercise are captured and distributed across the Alliance.
3. Address 'Time-Compression' through Hybrid Design. The challenges posed by hypersonic systems, AI-

driven autonomy, and Cyber effects share a common theme: compression of the decision window. NATO should move toward 'Hybrid Wargaming' models that combine traditional human-in-the-loop decision-making with AI-enabled adjudication tools. This enables safe-to-fail testing of delegated authorities, determining when and where human oversight is required before these high-speed systems are fielded in a live environment.

4. Normalise Experimental Evaluation. NATO must decouple wargaming outcomes from performance scoring. Commanders require the 'intellectual manoeuvre space' to test unconventional targeting strategies without the fear of poor evaluation. Wargaming should be treated as an experimentation laboratory where a loss is regarded as a high-value discovery for doctrine and experience. This cultural shift is essential for mastering MDO, where the interactions between lethal and non-lethal effects are non-linear and often unpredictable.
5. Standardise Cross-Domain Data Capture. To solve the 'Multi-Level Security Paradox', NATO should prioritise the development of standardised Cross-Domain Solutions (CDS), that enable secure, controlled, and audited data transfers between different security domains within the wargaming architecture. This would allow for the integration of sensitive Cyber and Space effects into broader targeting wargames without compromising national classification caveats, a prerequisite for realistic MDO training.

Conclusion

NATO should reframe wargaming not as an occasional training event, but as a repeatable learning and research method that generates evidence for planning and doctrine. That shift requires two practical changes: disciplined wargame design tied to clear analytical questions, and routine findings captured, assumptions tested, decisions taken, and effects observed, so lessons do not remain anecdotal.

This matters because NATO's doctrine development cycle is inherently political and often slow to absorb

operational feedback. Institutionalising analytical wargaming as a feedback loop, supported by appropriate digital tools including AI-enabled data capture and analysis, can help translate insights into usable products: refined targeting concepts, updated TTPs, and clearer guidance for planning under uncertainty. It also provides a means to better integrate non-lethal effects, whose timelines and interactions are difficult to assess through linear models but can be explored through structured, decision-centric scenarios.

Wargaming is not a substitute for operational experience, nor should it be treated as predictive. Its value is insight generation: exposing trade-offs, cascading effects, and adversary adaptation before they appear in conflict. Embedded properly, it becomes a normal part of NATO's targeting practice, complementing modelling and simulation, exercises, and real-world learning to improve decision-making in increasingly complex environments. ●

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ABOUT THE AUTHORS

Mr Adam T. Jux

Civilian Targeting Consultant

Mr Adam T. Jux is a retired Royal Air Force Officer who served in the Royal Australian Air Force and the Australian Army over his 27 years of military experience. He is a qualified targeteer and has worked in the discipline for the last 18 years, including on operations. He has instructed in targeting and collateral damage estimation and has mentored targeting

at the Joint and Component levels. He has published a number of articles and contributed to white paper research regarding targeting in general and its interaction with intelligence and other disciplines. He is currently working as a civilian targeting consultant for NATO's Joint Warfare Centre in Stavanger, Norway, under contract for Calian Europe AS.

Dr Christopher J. Morris

Wargaming Analyst Expert

Dr Christopher J. Morris is a Wargaming Analyst at NATO's Joint Warfare Centre in Stavanger, Norway, working under contract with Calian Europe AS. Prior to his current role, he was a Teaching Fellow at the University of Portsmouth. His published work includes analysis of the

war in Ukraine, military operations, professional military education, as well as research on digital learning in military contexts. He has written extensively for academic and policy audiences on contemporary conflict and emerging trends in modern warfare.