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FROM INDUSTRIAL MASS WARFARE TO DIGITALLY MEDIATED CONFLICT: THE WAR IN UKRAINE AS A TRANSITIONAL MODEL OF ARMED STRUGGLE

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Abstract. *This article examines the war in Ukraine as a transitional case in the evolution of armed conflict, situated between industrial mass warfare and a digitally mediated model of combat. Using a historical-comparative framework, it distinguishes enduring industrial features, including attrition, logistics dominance, and massed fires, from emerging digital mechanisms that compress the sensor–decision–strike–assessment cycle. The analysis argues that the decisive novelty lies not in the mere presence of digital tools, but in the contestable integrity of information flows shaped by electronic warfare, deception, and network disruption. The article concludes that contemporary operational advantage increasingly depends on learning speed, network resilience, and the capacity to sustain decision-cycle performance under continuous interference.*

Introduction

The war in Ukraine has rapidly become one of the most closely examined armed conflicts of the early twenty-first century. Beyond its geopolitical significance, the conflict attracts sustained scholarly attention because it unfolds at the intersection of two historically distinct models of warfare. On the one hand, it exhibits core features of industrial-era war, including mass mobilization, large-scale artillery employment, attritional logic, and the decisive role of production capacity and logistics. On the other hand, it demonstrates the growing centrality of digital technologies, such as networked reconnaissance, unmanned systems, real-time data exchange, and algorithm-supported decision-making. This coexistence positions the war not merely as another regional conflict, but as a transitional case that illuminates the shift from an industrial to a digital model of armed conflict.

In military history, periods of technological and organizational transition have rarely produced immediate and clean breaks with earlier forms of warfare. Instead, new modes of combat typically emerge through hybrid configurations in which

established practices persist while novel mechanisms gradually reshape the conduct of operations. The First World War, for example, combined nineteenth-century mass armies with early forms of mechanization and communications. Similarly, the late Cold War integrated industrial military structures with increasingly sophisticated information and command systems. The war in Ukraine follows this historical pattern, yet it does so under conditions of unprecedented data availability, digital connectivity, and rapid technological adaptation.

The central analytical challenge lies in distinguishing between continuity and genuine transformation. Not every technological innovation constitutes a change in the underlying model of warfare. For a transition to occur, technology must alter the structure of command and control, the temporal dynamics of combat, and the relationship between reconnaissance, decision-making, and firepower. In this sense, the defining question is not whether digital tools are present on the battlefield, but whether they reorganize the logic of military action and the balance between mass, precision, speed, and adaptability.

This article approaches the war in Ukraine as a case study of a transitional armed conflict. Its purpose is twofold. First, it seeks to identify historical parallels with earlier technological shifts in warfare in order to establish a comparative framework for analysis. Second, it aims to isolate the novel characteristics that indicate movement toward a digital model of conflict, particularly in the domains of reconnaissance, unmanned systems, networked command structures, and information warfare. By doing so, the article contributes to ongoing debates in military science and military history concerning the nature of contemporary war and the validity of claims about a new era of digitally driven armed struggle.

Methodologically, the study employs a historical-comparative approach combined with analytical typology. The conflict is examined across strategic, operational, and tactical levels, with attention to both material factors and organizational processes. The analysis is deliberately cautious with regard to empirical claims, recognizing the limitations imposed by incomplete data, operational secrecy, and informational distortion. Rather than offering definitive judgments, the article focuses on identifying stable patterns, observable mechanisms, and analytically meaningful indicators of transition.

The structure of the article reflects this objective. The first section examines historical transitions from industrial to information-intensive forms of warfare, outlining the key features of the industrial model and the criteria by which a digital model can be identified. The second section analyzes the war in Ukraine through this framework, highlighting its hybrid character and assessing the extent to which digital mechanisms reshape the conduct of combat. The conclusion synthesizes the findings and discusses their implications for military theory and future research on the evolution of armed conflict.

Historical Parallels and Analytical Criteria:
From Industrial War to Digitally Mediated Conflict

Transitions in the character of war have rarely followed a linear trajectory. Military history suggests that new technological possibilities reshape warfare only when they are absorbed into doctrine, organization, and the political economy of force generation. The industrial model of armed conflict emerged not simply from new weapons, but from the fusion of mass mobilization, standardized production, and logistics-intensive operations. Its historical hallmarks include the centrality of industrial capacity, the primacy of sustained firepower, and an attritional logic in which operational success is frequently determined by replacement rates, ammunition expenditure, and the endurance of institutions and societies under stress.

Earlier episodes of military transformation show a recurring pattern: innovations initially appear as tactical add-ons, then gradually restructure the operational system. The late nineteenth and early twentieth centuries illustrate this sequence. Railways, telegraphy, and mass conscription did not immediately overturn established concepts of maneuver, yet they enabled unprecedented scale and tempo, culminating in large formations locked into industrialized attrition. A comparable dynamic unfolded during the Cold War, when advances in sensors, electronics, and automated fire control enhanced precision and coordination, but did not by themselves eliminate the industrial foundations of military power.

Against this background, the concept of a digital model of armed conflict should be treated as an analytical category rather than a rhetorical label. Digitalization matters when it modifies the architecture of command and control and compresses the temporal cycle that links detection, decision, and action. In practical terms, the key issue is whether data flows and networked systems become decisive factors in targeting, force protection, and operational adaptation, rather than remaining supportive instruments within an industrial framework. A useful way to conceptualize the transition is to treat industrial warfare as resource-dominant and digitally mediated warfare as decision-cycle dominant, while acknowledging that both logics can coexist in a single conflict.

To operationalize this distinction, the article employs a set of comparative criteria that separates continuity from transformation. These criteria do not assume that mass disappears in a digital model. Instead, they ask whether mass is increasingly guided by data-driven reconnaissance, whether the battlefield becomes more transparent, and whether the competitive advantage shifts toward actors that learn faster, iterate technical solutions more rapidly, and protect the integrity of their networks under contestation.

Table 1

Diagnostic Criteria for Industrial and Digital Models of Armed Conflict

Dimension	Industrial model	Digital model
Core driver of advantage	Production capacity, mobilization, logistics throughput	Decision-cycle speed, network resilience, adaptive learning
Targeting logic	Preplanned fires, massed effects, slower correction	Sensor-to-shooter integration, rapid retargeting, continuous assessment
Force structure	Large formations, centralized control	Distributed units, modularity, decentralized execution supported by data
Vulnerabilities	Supply chains, ammunition stocks, industrial nodes	Communications, electronic spectrum, cyber dependencies, data integrity
Innovation tempo	Long procurement cycles	Short iteration loops, field-driven modification, software-defined effects

This framework establishes the historical baseline and the analytical lens for assessing the war in Ukraine. The next section applies these criteria to identify which elements of the conflict remain anchored in industrial mass warfare and which indicate a measurable shift toward a digitally mediated mode of combat.

The War in Ukraine as a Transitional Case: Hybridization of Mass and Digital Decision Cycles

When examined through the criteria outlined above, the war in Ukraine appears neither as a purely industrial conflict nor as a fully digital one. Its defining feature is hybridization. Industrial-era fundamentals remain decisive at the strategic and operational levels, while digital mechanisms increasingly shape tactical outcomes and the tempo of adaptation. This coexistence is not a contradiction. It is the empirical signature of a transition in which the material base of war continues to matter, but the competitive edge is progressively determined by the speed, reliability, and contestability of information flows.

At the industrial end of the spectrum, the conflict retains a mass and attritional character. Sustained artillery employment, high consumption of ammunition, large-scale fortification, and the persistent importance of logistics and repair capacity are all consistent with industrial warfare. Operational endurance depends on the ability to regenerate forces, maintain supply routes, and sustain production and external replenishment. In this sense, the conflict confirms a classical historical lesson: the ability to impose and endure material costs remains a central determinant of strategic outcomes.

At the same time, several mechanisms indicate a shift toward a digitally mediated model. The most consequential is the compression of the targeting cycle through networked reconnaissance and near-continuous battlefield observation. Unmanned aerial systems, distributed observers, and multi-source intelligence streams enable faster detection, more frequent retargeting, and more rapid correction of fires. The operational meaning of "tempo" changes accordingly. It is increasingly defined not only by movement of formations, but by the velocity of the sensor to decision to strike loop, and by the capacity to sustain that loop under electronic attack and deception.

The second mechanism is the mass diffusion of unmanned systems as both sensors and strike platforms. The conflict demonstrates that drones are not merely high-end assets reserved for specialist units. They function as scalable, replaceable components integrated into routine combat practice. This changes force protection requirements, increases the penalty for concentration, and raises the tactical value of dispersion, concealment, and electromagnetic discipline. It also accelerates innovation, because the feedback loop between frontline experience, rapid modification, and redeployment is shorter than traditional procurement cycles.

A third mechanism is the struggle for network integrity in the electromagnetic and cyber domains. Electronic warfare, jamming, spoofing, and counter-reconnaissance are not auxiliary activities. They are central to denying the opponent a functional decision cycle. The practical implication is that digital advantages are unstable. They must be defended continuously, and they can degrade abruptly. The digital model therefore does not eliminate friction; it redistributes it into connectivity, spectrum control, and the credibility of data.

Table 2

Observable Transitional Features in the War in Ukraine

Area	Industrial continuity	Digital transition signal
Firepower and attrition	High-volume artillery, sustained ammunition demand	Faster correction of fires via real-time observation
Force employment	Importance of logistics, repair, replenishment	Dispersion and micro-maneuver driven by persistent surveillance
Innovation and adaptation	Large systems with long supply chains	Rapid field iteration, modular add-ons, software-dependent effects
Vulnerability profile	Depots, transport nodes, industrial capacity	Communications, spectrum dependence, data integrity, sensor exposure

Taken together, these patterns support a precise claim. The war in Ukraine is best understood as a transitional stage in which industrial mass warfare remains structurally decisive, while digital mechanisms increasingly govern the efficiency, survivability, and adaptability of combat systems. The analytical task is therefore not to declare an end to industrial war, but to explain how digital mediation reshapes its conduct and how the balance between material production and decision-cycle performance evolves under sustained combat conditions.

Conclusion

The war in Ukraine demonstrates that industrial-era determinants of war, namely mass, production capacity, and logistical endurance, remain structurally decisive even under conditions of advanced technological diffusion. At the same time, the conflict reveals a clear shift toward digital mediation, where battlefield transparency, unmanned systems, and accelerated targeting cycles reshape tactical behavior and impose new vulnerabilities in the electromagnetic and cyber domains. The central implication is that superiority is increasingly measured by the ability to maintain the credibility and continuity of the sensor–decision–strike–assessment loop in a contested environment. Future research should refine measurable indicators of decision-cycle integrity and compare hybrid patterns across contemporary conflicts to clarify the trajectory of this transition.

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