Which War Are We Preparing For?

Andy Fawkes FIMechE
Thinke Company Limited

Abstract – Rapidly advancing weapon systems, particularly uncrewed systems, enter military service at unprecedented speed, challenging how warfighter training requirements are captured and met. Requirements that remained stable for years now evolve in days or weeks, driven by rapid software updates, tactical adaptation, and adversary countermeasures. Ukraine demonstrates this shift at scale, with the British Army's 20-40-40 construct anticipating a future force that is 80% uncrewed. A growing proportion of combat capability depends on systems whose configuration, employment, and vulnerabilities change continuously. This paper examines whether the challenge facing defence training organisations lies solely in accelerating existing instructional design processes, or whether it requires a more fundamental rethinking of how training demand is identified, prioritised, and acted upon. Drawing on evidence from contemporary conflicts and learning design models, the paper explores whether learning engineering approaches that treat training demand identification as a continuous, data-driven enterprise activity might better support forces preparing for rapidly evolving forms of warfare. Ukraine's experience, including operational data from more than 800,000 recorded drone strikes, demonstrates how training effectiveness can be assessed and adapted in near real-time. Rather than proposing prescriptive solutions, the paper seeks to provoke informed debate on whether Western defence organisations can adopt similar approaches while preserving assurance, safety, and institutional control.

1 Introduction: The Changing Nature of Training Demand

In 2025, Ukraine's Armed Forces recorded more than 800,000 video-confirmed drone strikes against personnel, vehicles, artillery, and other unmanned systems [1]. Accounting for 80% of Russian casualties [2], these strikes did not result from a single platform or static doctrine, but from thousands of incremental adaptations to software, tactics, and procedures made under combat conditions. This scale of data and rate of adaptation illustrates a broader shift in the nature of military training demand. Uncrewed systems now account for a substantial proportion of strike and reconnaissance activity in high-intensity conflict, and operators adapt and reconfigure these systems frequently. Software updates occur weekly, tactics evolve over the course of weeks, and new variants enter service within a single campaign. Each change generates incremental training demand, not for entirely new capabilities, but for revised procedures, countermeasures, and employment concepts.

This pattern differs markedly from that associated with many traditional military platforms. A fast-jet pilot's core training requirements typically remain stable across an aircraft's 20–30-year service life, with updates introduced episodically through formal upgrade programmes. By contrast, a drone operator may face software updates weekly, tactical changes monthly, and new system variants quarterly, potentially generating more than 100 distinct training requirement changes during a single conventional training development cycle.

The scale of contemporary conflict reinforces the significance of this shift. Ukraine's Army of Drones programme uses operational data not only to assess battlefield effectiveness but also to inform management and prioritisation decisions, including those related to training. When specific tactics prove ineffective against new jamming techniques, feedback from combat operations generates immediate demand for revised training, rather than one filtered through periodic capability reviews [3].

Comparable trends are evident internationally. Military drones are now in service with more than 100 states and numerous non-state actors, reflecting low barriers to entry and rapid diffusion of technology [4]. Russia has established dedicated Unmanned Systems Forces and plans to expand specialist drone personnel to more than 200,000 by the end of the decade, supported by new military occupational specialties and training institutions [5]. The United States has similarly indicated an intention to integrate uncrewed system proficiency across combat training pipelines by the late 2020s [6]. In the UK, the British Army has stated its intention to progress to a military effects achieved through a 20-40-40 mix of 20% crewed platforms, 40% reusable platforms (such as drones), and 40% consumables such as missiles and one-way drones [7].

These developments indicate that demand for training in uncrewed and software-defined systems is structural, expanding and enduring, not a temporary feature of a single conflict. However, current training systems, procurement processes, and institutional cultures remain principally optimised for long-life platforms with predictable demand profiles. The resulting question is whether these systems can adapt to track and respond to training demand that is continuous rather than episodic.

Beyond technology, the changing ratio of humans to uncrewed systems may alter the character of military institutions themselves, as forces transition from humans exercising close control of machines to humans increasingly partnering with autonomous and semi-autonomous systems, with implications for recruitment, education, training, careers and leadership [8].

2 From Episodic to Continuous Training Demand

2.1 Episodic Demand: Traditional Approaches

In many Western defence organisations, training demand is identified through formal requirements processes linked to capability development and force planning. These processes typically span several years from the identification of a capability gap to the delivery of an accredited training solution. Demand signals arise at discrete points, such as platform introduction, doctrinal revision, or post-operation review, and planners assume requirements remain broadly stable between these events. These approaches address genuine operational needs, but they are also shaped by procurement structures and investment horizons that favour stability.

2.2 Continuous Demand: Contemporary Operations

Experience from contemporary drone warfare demonstrates a different pattern. In Ukraine, operational feedback is aggregated through digital platforms capturing after-action reports, performance data, and operator observations in near real-time [8]. When adversary tactics change or new countermeasures appear, their effects become visible within hours or days. Training demand signals therefore emerge continuously, driven directly by operational data rather than episodic review cycles.

These demand signals are dynamic and emergent and cannot always be predicted through capability planning, as they arise from interaction with an adaptive adversary. In this context, the analyse phase of training design becomes an ongoing activity closely linked to operational outcomes and performance metrics, rather than a discrete step completed before training system development begins. Processes designed for stable or slowly changing demand profiles struggle to remain aligned when requirements evolve weekly. Even accelerated development cycles measured in months fail to keep pace where training relevance decays rapidly.

Table 1 summarises the key differences between episodic and continuous training demand.

Table 1. Episodic vs. Continuous Training Demand

Aspect	Episodic	Continuous
Demand Source	Formal capability reviews, new platforms	Real-time operational data, battlefield feedback
Demand Frequency	Episodic (years between signals)	Continuous (daily/weekly signals)
Demand Stability	Stable between episodes	Dynamic, constantly evolving
Demand Identification	Structured requirements processes (3-7 years)	Automated data analysis, operator feedback (hours/days)
Response Timeline	18-36 months (linear cycle)	Days to weeks (data-driven iteration)
Validation Method	Multi-stakeholder approval	Operational outcome tracking
Demand Predictability	High (platform lifecycles known)	Low (emergent from operations)

3 ADDIE in the Context of Rapidly Evolving Demand

Militaries use frameworks to ensure training is effective and standardised. One such framework is the widely known ADDIE model developed for the US Army in the 1970s. It is a five-phase process (Analyse, Design, Develop, Implement, Evaluate) with each phase informing and overlapping with the others. It supports predictability, traceability, and risk management, making it well suited to safety-critical training for stable platforms with long service lives. In such contexts, the assumption that training demand remains sufficiently stable throughout the development cycle generally holds.

Difficulties emerge when this assumption no longer applies. For uncrewed and software-defined systems, both technical configurations and tactics change continuously, driven by frequent software updates, rapid electronic warfare adaptation, and the accelerated fielding of new variants. Each iteration generates new training demand. When demand signals evolve faster than an instructional design cycle can complete, the analysis and design phases risk locking in requirements that no longer reflect operational reality by the time training is delivered.

The practical implications of this temporal mismatch are evident across multiple Ukrainian adaptations to rapidly changing electronic warfare and counter-UAS conditions throughout the conflict. Multiple sources report that the operational relevance of drone tactics and training can degrade within weeks. Some estimates place the effective lifespan of a tactic, technique, or procedure at approximately six weeks before adversary countermeasures emerge. In response, Ukrainian forces have relied on digitally mediated feedback loops using platforms such as Brave1, Delta, and the Army+ app to aggregate frontline observations, disseminate updated procedures, and iterate training content in near real time, often outside formal, sequential training development cycles [9].

This bottom-up, problem-driven approach contrasts with traditional Western acquisition and training timelines, which frequently span years. For example, the UK Collective Training Transformation Programme was launched in 2017 and has not yet progressed to contract, illustrating the timescales often associated with enterprise-scale training reform. As one Ukrainian warfighter observed, ‘We do in three days what NATO does in three months or three years’ [3].

Instructional design models such as ADDIE, when applied sequentially, assume that training demand can be analysed, stabilised, and specified long enough for design, development, accreditation, and implementation to complete. Where demand signals shift continuously, this assumption no longer holds. In such conditions, training systems tied to rigid, linear development cycles risk delivering instruction that is already obsolete upon arrival. This does not imply that ADDIE is inherently unsuitable. Rather, it highlights limits to its linear application under conditions of rapid change. The core issue is not instructional design quality, but the stability of the demand signal on which the process depends.

4 Learning Engineering: A Data-Driven Approach to Continuous Demand Tracking

Learning engineering is an iterative, data-informed process that applies learning sciences and human-centred engineering design to improve educational outcomes, and currently fostered by the IEEE International Consortium for Innovation and Collaboration in Learning Engineering (ICICLE) [10]. It treats learning as an engineered system whose performance can be measured, analysed, and optimised using operational data, rather than as a static curriculum. While established in civilian education and commercial sectors, its application within defence training systems remains nascent and uneven, making it a relevant but unfamiliar concept for many military training organisations.

Accelerating instructional design processes addresses symptoms rather than causes. The underlying challenge is not simply the speed of training development, but how training demand is identified in the first place. Learning engineering offers a fundamentally different approach: treating training demand identification as a continuous, data-driven enterprise system rather than an episodic process triggered by formal reviews.

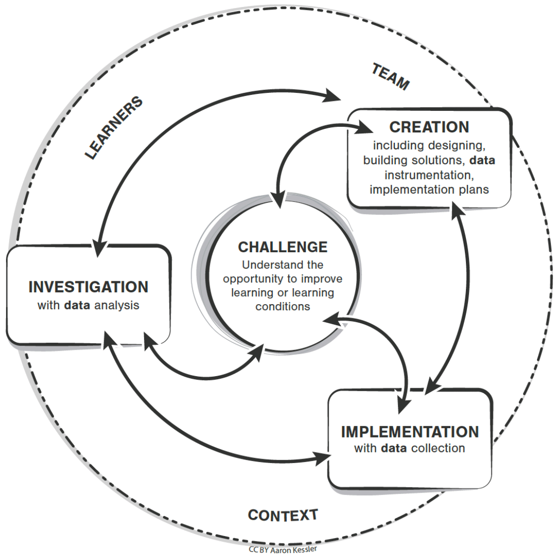

Fig. 1. The Learning Engineering Process Model [11]

From a learning engineering perspective, training is not a sequence of discrete products but a persistent system that adapts in response to performance data and operational outcomes. This approach emphasises continuous sensing of demand signals, prioritisation based on operational impact, and rapid adjustment of learning interventions. In environments characterised by software-defined warfare, such alignment between learning cycles and system adaptation cycles becomes essential.

In practice, this implies using operational and training data to identify emerging requirements, modular and versioned content that can be updated incrementally, and embedded evaluation mechanisms that assess effectiveness through observed performance rather than course completion alone. Ukrainian digital military platforms provide illustrative examples, where training effectiveness is inferred directly from operational outcomes and adjusted accordingly. Under this model, doctrine and training materials increasingly resemble software: versioned, updated, and distributed continuously as new evidence emerges. The central challenge is how such practices can complement established training processes while maintaining appropriate levels of assurance, safety, and governance.

What if there are no current operations? In the absence of combat operations, well-instrumented simulation and wargaming environments may serve as simulated demand signal generators, enabling continuous identification of training gaps under controlled conditions.

5 Implementation Challenges and Industry Implications

The shift from episodic to continuous training demand has significant institutional and industrial implications. Accreditation and regulatory frameworks are typically designed around stable curricula, making it difficult to accommodate content that changes frequently.

One potential response is to accredit processes and competency frameworks rather than static training packages, though this requires regulatory reform and cultural adaptation. Organisational culture also plays a decisive role. Military training systems place high value on standardisation and proven methods, and continuous adaptation may be perceived as instability rather than responsiveness. Distinguishing evidence-driven adaptation from uncontrolled change is therefore critical.

The shifts in the future force balance also affect the training and simulation market. The Chief of the General Staff in 2025 identified future investment over the next decade of approximately £70Bn for drones and £28Bn for one-way effectors, compared with £43Bn for armoured fighting vehicles [12]. These systems generate fundamentally different training demand signals: not stable, platform-centric requirements, but continuous adaptation driven by evolving software, threats, and tactics. Meeting this demand favours modular and agile simulation software, an effective enterprise data strategy and implementation, and service-oriented delivery models over long-lifecycle, platform-specific simulators.

6 Conclusion: Adapting Training Systems to Continuous Demand

This paper has argued that a central challenge for contemporary military training lies in the changing nature of the training demand signal itself. As uncrewed and software-defined systems assume a larger share of combat activity, training requirements increasingly arise from continuous operational adaptation rather than episodic events such as platform introduction or doctrinal change.

Training systems and processes developed for stable demand profiles struggle to remain aligned with requirements that evolve on much shorter timescales. Learning engineering approaches, which emphasise continuous sensing of demand, prioritisation based on operational impact, and rapid adjustment of learning interventions, offer one possible response. Evidence from Ukraine demonstrates that elements of such approaches can be implemented at scale, while also highlighting the institutional, regulatory, and cultural constraints that shape wider adoption.

Rather than proposing a prescriptive solution, this paper has framed a set of questions for further debate. Are defence organisations equipped to detect and interpret training demand signals generated by continuous operational change? Can existing assurance and governance mechanisms accommodate learning systems operating at operational tempo? And can training enterprises achieve the necessary balance between standardisation and responsiveness, or must one be sacrificed for the other?

The central question is therefore not whether military training systems should evolve, but whether they can evolve quickly enough. Forces risk fighting today's wars with yesterday's training if demand signals are identified and processed too slowly. Closing this gap requires enterprise resolve to treat training demand as strategic intelligence rather than administrative input, and to align learning systems with the tempo of contemporary operations and weapon technological development, before the next conflict reveals the cost of delay.

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Author/Speaker Biography

Andy Fawkes is a consultant, writer and engineer working in the field of simulation and training. He previously presented at IT2EC 2023 'From SIMNET to the Metaverse - Why is it taking so long?' and IT2EC 2024 'Uniting Human Data'. He is Special Correspondent for Military Simulation & Training (MS&T), co-chair of NATO MSG 234 Training Data Standards & Analytics, and a Fellow of the Institution of Mechanical Engineers (FIMechE). Formerly he served in the Royal Corps of Naval Constructors, was head of simulation policy for the UK MoD, and Chair of the NATO M&S Group.