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From Battlefield Learning to Transferable Capability

Ukrainian Export Ambition, Border Counter-UAS Deployment, and the Safety Case for Directed Energy

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Abstract

Battlefield experience has become an asset that governments and manufacturers want to move across borders. The receiving institution, however, needs more than an aircraft that once worked elsewhere. It needs the people, support, integration, and permissions that make useful performance reproducible. This essay examines that problem through Ukrainian export ambitions, AeroVironment's selection for Navy surveillance services, the reported installation of counter-drone equipment at the U.S. southern border, and an FAA-Department of War laser safety assessment. These developments describe different forms of transfer, each carrying a different evidentiary burden. The central argument is that successful transfer creates a receiving organization able to operate, question, adapt, and sustain the capability. Buying continued dependence on a supplier may sometimes be sensible, but it should be a deliberate arrangement rather than an unnoticed consequence of acquiring battle-tested hardware.

What can leave the battlefield

A machine can be shipped more easily than the practice that made it useful. That is the central difficulty behind the present demand for Ukrainian drone technology. Years of combat have produced equipment, but they have also produced habits of diagnosis, repair, coordination, and adaptation under conditions no export customer should wish to reproduce. A foreign buyer can acquire one part of that achievement while misunderstanding how much of the remainder it still needs to build.

Reuters' March 30 account places this distinction at the center of Ukraine's export ambitions. President Volodymyr Zelenskiy described expertise as a combination of skill, strategy, and system, with a drone forming only one part. Manufacturers reported foreign inquiries while waiting for government permission. The story therefore concerned a contested route to export, not a completed migration of battlefield effectiveness into another country. Ukrainian officials and businesses saw both a diplomatic opportunity and an industrial opening in the Middle East's demand for protection.[1]

The appeal is understandable. A customer confronting a difficult threat wants evidence that a proposed solution has met something more demanding than a favorable demonstration. Combat experience can expose weaknesses, force quick improvements, and create unusually knowledgeable operators. The mistake would be to treat experience as a detachable property of the enclosure, available unchanged to whoever purchases the next unit. The product may have benefited from a surrounding organization that is absent from the export package.

This is not an argument against transfer. It is an argument about what the buyer should expect to receive. A product can be useful even when the customer's organization is different, provided the difference is understood and the necessary work is done. Training, maintenance, technical support, and local evaluation can turn an inherited advantage into something repeatable. Leaving those activities implicit makes success depend on informal help and assumptions that are difficult to sustain once the first enthusiastic team departs.

There is also a political dimension to what travels. Ukraine's government has reasons to coordinate exports, preserve weapons needed at home, and protect the credibility of its industry. Firms have reasons to move quickly while foreign demand is unusually strong. Receiving governments want assistance on timelines set by present danger. These interests can align without being identical. An export policy must distribute scarce attention and expertise as well as equipment, and a signed commercial arrangement cannot by itself resolve that distribution.

The resulting question is more useful than asking whether a product is combat-proven in the abstract. Which parts of the original achievement are contained in the delivered system, which are supplied through a continuing service, and which must the customer create? The answer determines the real cost and timetable. It also determines whether the purchaser is acquiring an independent capability, a supported operational relationship, or a machine that will need a substantial institution built around it.

Experience has conditions attached

The Ukrainian export story contains a warning against treating know-how as an accessory. Reuters reported Zelenskiy's criticism of an unnamed company that sold interceptors without the government involvement needed to make soldiers available for training. The account illustrates a practical failure mode: the hardware transaction can outrun the arrangement that would make it usable. It is a reported criticism by the president, not an independently reconstructed case study of that sale.[1]

The general problem does not depend on accepting every detail of that account. Expertise often exists in people who have competing responsibilities. A training team cannot simultaneously support every foreign customer and every urgent domestic mission. An engineer who can diagnose an unusual fault may be central to the supplier's development work. Export plans that assume these people are available without specifying their role will overstate how quickly the customer can become proficient.

What should move, then, is a disciplined explanation of the conditions under which the system has been useful. That includes the customer's responsibilities, the supplier's support commitments, and the changes expected during local introduction. It should also include failures and known limits. A collection of successful engagements selected for a presentation may demonstrate that something happened. It gives a much thinner account of how often the relevant situation arose, what support was present, and when the same approach did not work.

The receiving organization needs permission to question the package. That can be uncomfortable when a seller's reputation rests on hard-won experience and a buyer is anxious to deploy quickly. Respect for battlefield knowledge should encourage serious examination rather than replace it. An experienced operator is often best placed to explain the limits of a particular approach. A commercial process that only rewards certainty can suppress precisely the information the buyer most needs.

This is also a question of ownership. A customer may receive equipment while relying on proprietary software, remote technical support, or a supplier-held archive of failure information. Continuing dependence can be reasonable, particularly where expertise is scarce and the mission urgent. It becomes a problem when it is priced and described as though the customer has acquired full autonomy. The contract should make clear who can investigate faults, authorize changes, and preserve operational knowledge if the original supplier is unavailable.

The transfer cannot simply copy the battlefield's tolerance for risk. An institution defending a civilian airport, port, or border facility operates within its own responsibilities to other people. Its environment includes legitimate activity whose interruption may itself cause harm. Those differences do not erase the value of Ukrainian experience. They change the conditions under which that experience should be applied and the people who must be involved in deciding whether the local arrangement is acceptable.

The durable export is therefore a capacity to keep learning. A receiving organization should be able to recognize a mismatch, report it in a useful form, and obtain a correction without losing the history of what changed. If all adaptation remains inside the seller, the customer has purchased a service relationship whether the invoice says so or not. Making that relationship explicit is the beginning of an honest account of capability transfer.

Local evaluation should be designed around uncertainty rather than ceremony. The customer needs to identify the important differences between the claimed experience and the proposed use, then examine those differences under controlled conditions. A demonstration can contribute to that inquiry, but it should not be organized so that the only permissible result is reassurance. Observed difficulties are valuable when they lead to a changed requirement, an additional support commitment, or a justified decision not to proceed. The purpose is to discover what the receiving organization will have to do, including the tasks that were invisible when a supplier's most experienced personnel were doing them.

Sometimes the purchase is a service

AeroVironment's April 1 Navy announcement offers a useful contrast because it explicitly describes a service arrangement. The company was selected to compete for delivery orders for contractor-owned, contractor-operated intelligence, surveillance, and reconnaissance services alongside other industry partners. It presented JUMP 20-X, payload integration, and personnel expertise as part of the offering. Selection gives the company a route to compete for work. The release does not identify a particular delivery order, its funded value, or completed acceptance under that new arrangement.[2]

The distinction matters because a customer can deliberately purchase performance without owning every means used to provide it. In such an arrangement, the supplier's continued presence is part of the design. The meaningful question becomes whether the customer can specify, observe, and enforce the service it needs. An aircraft's advertised endurance is relevant, but so are availability, support, the quality of the delivered information, and what happens when the service is interrupted.

This changes the unit of evaluation. A platform with impressive technical characteristics may still fail to provide an adequate service if its supporting organization cannot sustain the required rhythm. Conversely, a well-supported system with more modest specifications may reliably meet the actual requirement. The buyer should evaluate the configuration and operating arrangement together. Treating a product sheet as a complete account of the service leaves much of the promised value outside scrutiny.

Data rights become central. Surveillance is useful because it produces information that someone can interpret and act on. The customer needs to know what records it receives, how they can be retained, and what access survives the end of the contract. The supplier may have legitimate proprietary interests in its methods. Those interests should be negotiated alongside the customer's need to investigate performance and avoid being stranded with an archive that can only be read through a vanished service.

Contractor operation also changes responsibility without making it disappear. The customer needs a clear account of who performs maintenance, supervises changes, provides qualified personnel, and responds to an incident. The contractor needs a workable definition of the service and its boundaries. A good arrangement lets each side

identify a failure in terms that can be remedied. A vague promise of persistent awareness can remain rhetorically attractive long after the parties discover that they meant different things by persistence.

The Navy case should not be enlisted as proof that every customer should adopt this model. Military services, local public-safety organizations, and foreign governments have different authorities and needs. It shows that transfer can be structured honestly around continuing supplier participation. That may be preferable to pretending that a complicated operational practice has been fully conveyed through the sale of equipment and a short course. The choice should be made deliberately, with an account of its long-term consequences.

The same discipline applies when a customer eventually wants greater independence. A service can help an institution learn what it needs before it builds its own organization. It can also become a durable dependency if knowledge, interfaces, and records remain inaccessible. A transition plan should explain which of those futures the parties intend. Otherwise a procurement chosen for speed may quietly determine the customer's technical freedom years later.

An evaluation of the service also needs to distinguish a missing observation from a reassuring observation. If the system was unavailable during an important interval, the absence of a reported event does not establish that nothing relevant occurred. If a mission was completed using extraordinary supplier support, the customer needs to know whether that support is included in ordinary delivery. These are basic questions about what was provided and under what conditions. They let the parties recognize a service shortfall without demanding impossible certainty about the whole environment, and they prevent an impressive aggregate description from concealing a gap at the moment the service mattered.

From equipment to a border network

The April 2 government account of counter-UAS deployment at the southern border describes another kind of transfer: separate capabilities being assembled into a larger operational system. JIATF-401 reported deploying more than $20 million in technology over four months, including thirteen sensors and seven mobile or fixed mitigation systems. The article emphasizes site surveys, integrated command and control, interagency collaboration, and feedback from users. Those are government-reported installations and activities, not an independent measurement of the network's effectiveness.[3]

The quantities are useful because they make the announcement more concrete. They do not supply a measure of coverage. Thirteen sensors can be a significant addition without telling an outside reader what area is protected, how reliably relevant activity is detected, or how conditions vary between locations. Equipment counts become informative when connected to a mission and a testable requirement. Without that connection, they primarily describe inputs to a capability whose performance remains a separate question.

Integration creates both value and responsibility. A sensor can produce an observation that another system interprets. A person must decide what the observation means, and an authorized organization must determine what response is appropriate. The whole arrangement can fail even when every purchased component behaves within its specification. The important problem may be the handoff: incompatible timing, misunderstood information, or unclear responsibility for deciding when confidence is sufficient.

This is why the reported feedback relationship matters. Users can reveal difficulties that were invisible during selection, including workload, maintenance burden, and the practical consequences of uncertainty. Their observations should reach the people able to change the system. A feedback process that ends in a presentation has a different value from one that changes a configuration, updates training, and checks whether the correction worked. Transfer becomes institutional learning only when that return path functions.

The border account also discusses expanded authorities and the need for tools, training, and permissions. This is an important public acknowledgment that possession and lawful employment are different matters. The article is not a complete legal explanation of every operation. It should not be used to infer that a technology can be employed by any organization in any location merely because a federal unit has received it. The receiving institution's authority is part of the capability it must establish.[3]

The April 6 announcement broadens the scale. JIATF-401 reported commitments exceeding $600 million across Operation Epic Fury, World Cup protection, and defense-critical infrastructure. The money spans different purposes and timelines. It is a portfolio of commitments, not a single delivered network or a common measure of protected people. Its significance lies partly in the speed and scale of institutional attention. The next question is how the separate purchases and installations are made accountable to their respective missions.[4]

The public should be able to follow that progression at an appropriate level of detail. Sensitive locations and technical methods need not be disclosed to report broad delivery status, support arrangements, and the existence of relevant performance evaluation. An expenditure becomes more intelligible when the government explains what operational gap it was intended to address and what kind of evidence will indicate progress. Secrecy about methods should not require permanent ambiguity about whether a capability has become usable.

The relationship between emergency spending and enduring support deserves particular attention. A rapid purchase can solve an immediate equipment shortage while creating a later obligation to maintain several different systems. The institution needs people who can support the combination, parts that remain obtainable, and a budget that survives the urgency of the initial announcement. Planning those obligations does not detract from speed. It protects the value of the rapid investment by preventing installation from becoming the high point of a capability's useful life. A network intended to learn from users must also remain serviceable long enough for those lessons to matter.

A defense can create a second hazard

Today's FAA announcement adds a different burden to the transfer problem. The agency and Department of War say they completed a safety assessment of a high-energy laser counter-drone system after observing demonstrations the previous month. The FAA states that appropriate controls are in place and that the assessed system does not pose undue risk to passenger aircraft. The announcement also commits the departments to continuing coordination. This is an important institutional decision about an assessed arrangement, not a public release of its complete hazard analysis.[5]

The distinction is necessary because a defensive technology can succeed against its intended target while introducing another risk. Evaluating that risk requires attention to people and systems outside the immediate engagement. The defender's mission is not the only activity taking place in the airspace. A convincing safety account must explain why the proposed use is compatible with the responsibilities owed to those other users. The relevant evidence is therefore different from a demonstration that the equipment can defeat a drone.

The FAA's participation matters for precisely that reason. An agency responsible for aviation safety is bringing a different institutional duty to the assessment. Cooperation does not eliminate conflicting pressures, but it can make them explicit before operations depend on an unsafe assumption. The military's need to address an evolving threat and the aviation system's need to protect passengers should be treated as simultaneous requirements. A solution that satisfies one by quietly transferring risk to the other is incomplete.

The public release does not identify the complete configuration, technical limits, or operating envelope underlying the assessment. It would be wrong to invent those details or to infer a general certification for every laser system and location. The appropriate public reading is narrower: the agencies state that their assessment supports the

system and safety controls they examined, and that coordination will continue. A receiving organization considering a different arrangement must establish whether the same reasoning applies.

There is a common temptation to treat safety as a completed document attached to a product. The more useful understanding is a relationship between a defined activity, the conditions in which it occurs, and the controls that keep its risks acceptable. Changes to those conditions can change the relationship. A different operating context, supporting system, or pattern of use may require a fresh question even when the principal equipment retains the same name.

This does not imply that every change must restart the entire process. An effective safety practice distinguishes changes that preserve the relevant basis from changes that undermine it. The assessment should make that distinction possible for the organizations responsible for continued operation. Otherwise one of two failures follows: justified improvements are delayed because nobody can explain their significance, or important changes inherit confidence from an assessment of something else.

The strongest objection is urgency. Threats do not pause while institutions perfect their documentation, and delay can leave people exposed. That is a serious argument for disciplined concurrent work, usable interim decisions, and clear responsibility. It is a weak argument for leaving the safety basis unintelligible. An institution under pressure especially needs to know which controls are essential, who can change them, and when an activity should stop. Those decisions cannot be left to the confidence generated by a successful demonstration.

The reward for doing this work is larger than avoiding one incident. A well-understood assessment can make future introduction faster because it preserves what has already been learned. The next team can see which assumptions held, what evidence was relevant, and which differences require attention. Safety then becomes part of transferable institutional knowledge. Without that history, each new site either repeats the work inefficiently or borrows a conclusion without understanding the conditions that made it defensible.

The receiving institution is part of the product

Across these cases, the valuable thing being transferred changes shape. Ukraine offers equipment and experience. The Navy service model includes an operating organization. The border deployment joins sensors, effectors, authorities, and users. The FAA assessment addresses the compatibility of a defensive system with other aviation responsibilities. Treating all four as purchases of hardware would obscure the work that connects them to a useful outcome.

The political appeal of quick acquisition is strong. A visible delivery can answer an immediate demand for action. An official can point to installed equipment; a company can point to selection; a receiving government can point to a partnership. These events can be necessary and valuable. They become misleading when the public account has no place for the less visible work still required: training, support, evaluation, coordination, and sustained responsibility for changes.

That work should be financed as part of the capability. If the price of equipment leaves no resources for the people who keep it useful, the apparent bargain can become an expensive form of dependence. Conversely, a service arrangement may appear costly because it makes those continuing activities visible on the invoice. Comparing the alternatives requires an account of the same mission over a realistic period, with the burdens assigned to the organization that will actually carry them.

There is also an obligation to the people whose experience creates the export advantage. Battlefield knowledge is not generated by an ordinary product-development exercise. It arises through danger, loss, and sustained adaptation. A responsible commercial arrangement should preserve the knowledge needed for useful service

without treating the people who hold it as infinitely available. Training and support commitments should reflect the supplier's domestic obligations and the receiving customer's need for an arrangement that can endure.

The receiving institution should emerge better able to judge its own situation. It should know what it has acquired, what support remains external, which assumptions need local checking, and how changes are handled. Complete independence may be neither possible nor desirable. A clear understanding of dependence is still possible, and it is a practical form of sovereignty. It lets a customer negotiate, maintain alternatives, and recognize when an apparently familiar service has changed beneath it.

That understanding should extend to an orderly ending. A partnership may change because requirements move, a vendor fails, or a different arrangement becomes preferable. The customer still needs its records, an account of the equipment left behind, and a safe way to suspend activities it can no longer support. Exit is often treated as a remote commercial detail while everyone is focused on introduction. It is actually a test of how much capability has been transferred. An institution that cannot stop using a service without losing its own knowledge has acquired a more consequential dependency than its initial purchase description may suggest.

As of April 10, the record describes export ambition, a selection for competing service orders, reported installations and financial commitments, and a stated aviation-safety assessment. These are different stages in different projects. Their shared lesson is that experience becomes transferable capability through organized work at the receiving end. The useful measure of success will be whether that organization can reproduce the relevant performance, understand failures, and sustain the system without relying on assumptions that arrived unexamined with the shipment.

The strongest transfer leaves behind more than a working device. It leaves people able to question the device, records that make its limits understandable, and relationships that support adaptation when the next problem differs from the last. That is how a customer's purchase becomes a capability rather than a prolonged demonstration. It is also how hard-won battlefield learning can retain its value without being mistaken for a guarantee that travels unchanged under every new sky.

Notes and sources

1. Reuters, March 30, 2026, “Ukraine's drone masters eye Iran war to kickstart export ambitions.” Used for attributed government and industry positions concerning export permission, expertise, training, and industrial ambition; promotional production and effectiveness claims are not adopted as independently established outcomes. Contemporaneous report.
2. AeroVironment, April 1, 2026, announcement of selection for Navy contractor-owned, contractor-operated ISR services. Explicitly describes competition for delivery orders alongside other selected partners. It is issuer disclosure and does not identify funded orders or acceptance under the new selection. Original release.
3. Department of War, April 2, 2026, JIATF-401 southern-border report. Attributes more than $20 million deployed over four months, thirteen sensors, seven mitigation systems, integration work, and the discussion of authorities to the task force. Equipment counts are not treated as performance measurements or a general statement of legal authority. Government account.
4. Department of War, April 6, 2026, report of JIATF-401 commitments exceeding $600 million across distinct missions. Commitments are preserved as commitments, rather than a claim of delivery or acceptance of a unified capability. Government account.
5. Federal Aviation Administration, April 10, 2026, “FAA and DOW Sign Landmark Safety Agreement to Protect Southern Border.” Supports the agencies' reported assessment, demonstrations, safety conclusion, and continued coordination. The public announcement does not supply the complete system identity, hazard analysis, or operating limits; these are not invented here. Original FAA announcement.