

Scaling Expertise

An Imminent Conversion

By Matt Waters



Matt Waters
AVA Founder
(904) 233-4864 (mobile)
Email: matt@avisualalgorithm.com
Website: <https://avisualalgorithm.com>

INTRODUCTION

The How-To Challenge

Every organization needs an effective way to communicate the “how to” of its day-to-day work. Unfortunately, most of today’s training is still provided in a classroom or virtually; removed from the job site where most practical learning happens. Many businesses also have challenges with the text-based standard operating procedures (SOPs) and other instructions they rely on to perform work, because these documents are often, outdated, inaccurate or regularly invite misinterpretation of both complex and simple procedures merely because of how processes are explained.

For companies that manufacture consumer products, there is the added responsibility of helping buyers easily understand how to assemble, use and care for what they buy, where, again, text-based user guides have proven unsatisfactory for the average consumer.

Building on these challenges, the U.S. military faces an even more demanding environment for communicating “how-to” knowledge. Unlike most organizations, military operations occur in rapidly changing conditions where equipment is continuously upgraded, mission requirements shift in real time, and the consequences of misunderstanding procedures can be severe. Maintainers and operators must work across increasingly complex systems—often under pressure, in austere environments, and with limited time to reference traditional materials. At the same time, a high rate of personnel turnover means that hard-earned experience is constantly leaving the force, forcing units to relearn critical tasks rather than build upon accumulated knowledge. This creates a persistent gap between what is documented, what is taught, and what is actually executed in the field—highlighting the need for a more adaptive, experience-driven approach to delivering and sustaining “how-to” understanding at the point of need.

The white paper that follows presents AVA’s recommended modernization approach for Army learning: an AI-enabled, multimedia-driven apprenticeship model that captures, structures, and distributes real-world operational experience across the force.

The paper is organized around four questions: What is the need? What is the solution? What is the operational benefit? What should the Army do next?



WHITE PAPER

Transforming Army Learning: *A System of Continuous Improvement for Operational Readiness*





EXECUTIVE SUMMARY

The U.S. Army's ability to maintain readiness in increasingly complex and rapidly evolving operational environments is constrained by a structural gap between institutional training and operational learning. While the Army's training enterprise delivers foundational instruction, the most critical expertise is developed in the field and is often lost, inconsistently applied, or not reintegrated into training systems.

At the same time, the character of warfare is changing rapidly. Artificial intelligence, autonomous systems, distributed networks, software-enabled equipment, and faster adaptation cycles are reshaping how military organizations must learn. The Army must modernize not only what it trains, but how quickly it captures and scales knowledge from operations.

AVA proposes an AI-enabled, multimedia-driven apprenticeship model that captures, structures, validates, and distributes real-world operational experience across the force. This approach enables continuous transformation at the speed of operations and strengthens the connection between schoolhouse instruction, operational execution, and organizational learning.

- Increase training throughput
- Reduce time-to-proficiency
- Improve retention and execution accuracy
- Reduce dependency on limited expert personnel
- Establish a continuous learning system connecting training and operations

This is not a proposal to replace existing training systems. It is a proposal to strengthen them by ensuring that the Army can capture, refine, and reuse what it learns every day in operations.



NEED

The How-To Challenge

Every organization needs an effective way to communicate the how-to of its work. Yet most training remains tied to classrooms, documents, and event-based instruction, separated from the place where practical learning actually happens. Text-based manuals and SOPs often become outdated, invite misinterpretation, or fail to convey complex procedures clearly enough for modern execution environments.

In the Army, this challenge is amplified. Soldiers and maintainers operate in dynamic conditions where systems are continuously upgraded, mission requirements shift in real time, and the consequences of misunderstanding procedures can be severe. Complex platforms, high operational tempo, austere conditions, and limited time for reference all increase the cost of weak knowledge transfer.

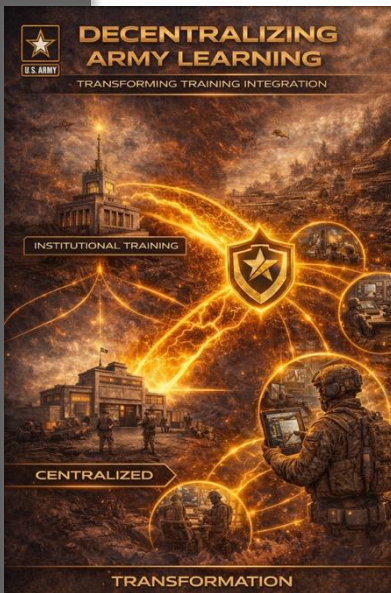
Operational Urgency

The Army is operating in a period of accelerated technological change. Artificial intelligence, drones, distributed sensing, mobile computing, and rapid software iteration are changing the pace of competition. Adversaries are adapting quickly and often at lower cost. Legacy training and acquisition processes, many designed for slower change cycles, cannot fully keep pace with these demands.

Without a mechanism to continuously capture and distribute learning from the field, the Army risks maintaining a structural lag between innovation and execution. The result is repeated mistakes, slower adaptation, and over-reliance on a shrinking pool of experienced personnel.

Key Constraints

- **Training is event-based.** It occurs in classrooms or controlled environments, is limited in duration and scope and is disconnected from real-world variability.



NEED

- **Operational learning is uncaptured.** Expertise is developed during maintenance, troubleshooting, and mission execution, but it often remains with individuals and rarely scales beyond the unit.
- **High turnover leads to knowledge loss.** Rotations, promotions, and attrition cause the Army to relearn lessons rather than build on accumulated experience.
- **Increasing system complexity raises the bar.** Modern systems require diagnostic reasoning, judgment under uncertainty, and adaptation to changing conditions.

In short, the Army does not have a motivation problem. It has a learning integration problem: training is centralized, while real learning is decentralized.



SOLUTION

AVA: A Multimedia, AI-Enabled Apprenticeship Approach

AVA enables the Army to use existing technical manuals, curriculum, and trainer expertise to capture real-world operational experience and convert it into structured, scalable learning assets that can be used in the field.

The AVA approach begins with the reality that the Army already learns through apprenticeship-like methods: soldiers work alongside experienced NCOs, perform real tasks, make mistakes, receive correction, and improve through repetition. AVA does not replace this model. It makes it visible, structured, scalable, and continuously improvable.

How It Works

Step 1: Embed learning in operations. Soldiers use AVA-enabled tablets or field tools to follow multimedia-guided procedures while performing real tasks in real environments.

Step 2: Capture expertise in real time. Trainers, NCOs, warrant officers, and SMEs provide context, decision rationale, corrections, and observations while AVA captures actions, deviations, and insights.

Step 3: Structure and scale learning. AVA transforms raw experience into step-by-step modules, visual procedures, troubleshooting logic, decision pathways, and interactive assets.

Step 4: Feed learning back into T2COM. Outputs are reviewed, validated, integrated into curriculum, and distributed across units, creating a continuous feedback loop.

In this model, handheld devices are not merely display tools. They become mobile knowledge nodes that align with the Army's shift toward decentralized, software-enabled operational capability.





AVA is not creating new training from nothing. It is capturing and scaling the learning that already happens.

Training Modifications Required to Support the Model Alignment with Army Culture Transformation

The Army is moving toward a culture of speed, adaptability, decentralized innovation, and faster iteration.

AVA directly supports this by enabling bottom-up learning from operational units, reducing dependence on slow update cycles, and allowing validated knowledge to move quickly from the field into schoolhouses and back again.

Recommended Structural Changes

- **Employ a forward-deployed learning model.** Use a rapid fielding initiative or new equipment training-like approach that embeds T2COM reach with operational units to capture field-level expertise and identify performance gaps.
- **Establish multimedia production cells within schoolhouses.** Staff these cells with instructors, SMEs, and interactive media specialists who convert captured knowledge into visual procedures and decision-support tools.
- **Formalize the trainer expansion role.** Trainers should not only teach and mentor locally; they should also contribute to captured content, validate procedures, and annotate real-world insights. This role should be recognized in duty positions, evaluation criteria, and incentives.
- **Build a continuous feedback loop into doctrine and curriculum.** Shift from periodic updates to continuous, data-informed, field-driven updates managed by the training command and the Centers of Excellence.



- **Integrate training into operational toolsets.** Along with LMS and classroom delivery, training should also be embedded in tablets, maintenance workflows, and diagnostic tools so that learning becomes part of doing the job.

In its current role, the training command develops curriculum, delivers training, and certifies learners. In its expanded role, it becomes a knowledge capture authority, a content production engine, an operational learning integrator, and a continuous improvement driver.

This approach does not replace instructors, disrupt unit operations, or require major restructuring. It connects what already exists, scales what already works, and preserves what is currently lost.

Apprenticeship Reimagined

Traditional apprenticeship is one of the most effective ways to build capability because it teaches in context. However, it is usually limited by locality, inconsistency, turnover, and limited visibility. Soldiers learn from who happens to be present, in the unit they happen to be in, with mentors whose expertise is not systematically captured or shared.

AVA transforms apprenticeship from a local practice into a scalable, expert-driven, continuously improving system. Instead of learning only from a nearby mentor, soldiers learn from validated expertise captured across the force and delivered at the point of need.

The Role of AI

- Organize and categorize captured knowledge for efficient retrieval
- Identify common error patterns and learning bottlenecks
- Recommend targeted content updates based on usage and performance



- Support progress tracking, readiness insight, and proficiency measurement
- Amplify expert knowledge rather than replace expert judgment
- AI's role is not to replace trainers, NCOs, or SMEs. Its role is to help the Army make better use of what those experts know by organizing, surfacing, and accelerating continuous improvement.

A sample user interface approach is illustrated below. See examples of how this strategy has been used to benefit operations in both the military and industry on page 9.

MOBILE & LAPTOP Formats

Home Screen

LEGEND

1. Topic and branding are found on the Home screen
2. Written instructions support video content
3. Warnings/Cautions/Notes linked for immediate reference
4. Navigation to the Home screen, *Table of Contents*, or special information
5. Narrated video and animation provide step-by-step demonstration.
6. Back and Next buttons let users move at their own pace

MOBILE Format

LAPTOP Format

- 1 Home Screen
- 2 Written instructions
- 3 Warnings/Cautions/Notes linked for immediate reference
- 4 Navigation to the Home screen, *Table of Contents* or special information
- 5 Back and Next buttons let users move at their own pace

LAPTOP Format



BENEFITS

Operational Impact

Increased training throughput. Learning becomes more distributed and self-guided, reducing exclusive reliance on instructor-led sessions.

Reduced time-to-proficiency. Soldiers learn faster because learning occurs in context and through real application.

Improved retention. Experiential learning is reinforced through repetition and tied to real outcomes.

Reduced dependency on key personnel. Expert knowledge is captured, shared, and institutionalized.

Enhanced readiness. The result is faster diagnostics, fewer repeat errors, and more consistent performance across units.

This model also strengthens lethality and operational effectiveness. Faster access to validated knowledge enables quicker decision-making, more accurate execution, and less delay between identifying a problem and solving it.

At the institutional level, the training command becomes the architect of a continuous learning system rather than only a provider of training events.

One unit's experience becomes the Army's capability.

See real-world AVA examples on the next page

MILES XXI

COMBAT VEHICLE LASER SIMULATION

U.S. ARMY

05:00
175m

MILES XXI TRAINING

Quickly Set Up and Synchronize Laser Exercise Data Using QR Codes and Smart Devices

- ✓ Scan QR code for instant access to training setup
- ✓ Receive rapid scenario updates
- ✓ Synchronize directly with combat vehicles
- ✓ Save hours of preparation time

F/A-18 LANDING GEAR

RIGGING – MLG MECHANISM ASSEMBLY
LANDING GEAR SYSTEM

NAVY
PROVEN SOLUTIONS. REAL IMPACT.

LANDING GEAR
PROCESS REVISION STEPS

F/A-18 LANDING GEAR
RIGGING – MLG MECHANISM ASSEMBLY

REAL IMPROVEMENTS. MISSION-READY RESULTS.
Multiple PSVs for this aircraft platform made significant improvements in safety, reliability, and readiness, per time.

GENERATOR REBUILD INCREASED RELIABILITY	FLAP DAMAGE RATES ANNUAL SAVINGS	LANDING GEAR RIGGING SAFETY & COST IMPACT
20 TIME BETWEEN FLIGHT → 400 FLIGHT HOURS 20X IMPROVEMENT	\$1.5 MILLION	2 FATALITIES \$565 MILLION IN DAMAGES COULD HAVE BEEN AVERTED OVER A 2 YEAR

PSVs Corrected Landing Gear issues, Adding \$565 Million in Benefits to Aircraft Platform That could have Been Averted Over a Two-Year Period

BETTER PROCEDURES. STRONGER FLEET. SAVING LIVES.

EA-6B LANDING GEAR

REVOLUTIONARY MULTIMEDIA FOR NAVY & MARINE CORPS

NAVY

EA-6B LANDING GEAR
PROCEDURE UPDATES & STEP-BY-STEP TRAINING

82% of procedures corrected

EA-6B NOSE LANDING GEAR RIGGING

STEP-BY-STEP VISUALS
AUDIOGUIDE
ANYTIME, ANYWHERE

Multimedia Training Enhanced EA-6B Procedures for the U.S. Navy and Marine Corps, Revising 82% of Technical Steps Over a 41-Year Legacy, Modernizing Outdated Information to Increase Safety, Efficiency, and Readiness.

IMMEDIATE UNDERSTANDING Unfamiliar Procedures Mastered	82% OF PROCEDURES CORRECTED 41-Year-Old Instructions Revised	41 YEARS Outdated Procedures Revised
--	--	--

PROVEN SOLUTIONS. REAL IMPACT.

TOYOTA

Southeast Toyota Distributors, LLC

TOYOTA PAINT PROTECTION

Standardizing Vehicle Paint Protection Across the Southeast

TOYOTA
Highlander Front Bumper Clear PPF

REDUCED COMPLETION TIME FROM DAYS TO HOURS

- 1. CAPTURE PROCESS**
Film procedure
- 2. GUIDE TECHS STEP-BY-STEP**
Provide visual and audio instructions
Monitor progress for high-quality results



CALL TO ACTION

Recommended Next Steps

- **Pilot.** Initiate a 90- to 120-day pilot focused on a maintenance-centric unit and 1-2 defined tasks such as vehicle component removal.
- **Metrics.** Track time to task completion, reduction in repeat issues, time to proficiency, and trainer or leader workload impact.
- **Integration.** Engage G-3/5/7 and a relevant Center of Excellence to define the feedback loop, validation process, and integration pathway.
- **Review.** Demonstrate captured modules, review findings, and assess scalability after pilot completion.
- **Expand.** If successful, scale to additional tasks, units, and formal training pathways.

This pilot structure aligns with the Army's emphasis on rapid iteration and proving capability in months, not years.

FINAL STATEMENT

The Army already learns through experience. AVA ensures that experience is captured, structured, validated, and used to strengthen the entire force, not just the unit that lived it.

This is not a new training system. It is a system that allows the Army to capture and use what it learns, to modernize faster, and to fight with the advantage of accumulated knowledge.

“If we do not change our processes from lessons learned, then they are really just lessons observed.”

