Playing to Win

Battlefields are moving to space and cyber landscapes, and so can our military training.

Wargames have long been played to evaluate military scenarios and make decisions about tactics and strategies to use in real warscapes. Chess, one of the worlds' most historied and well known games, is widely considered the original wargame. Chess originates from the Indian game chaturanga, invented during the Gupta Empire's 320-550 AD reign. In the 15th and 16th centuries, courier chess was developed in Germany as a pastime for hobbyists and a tool for analyzing military and political strategy. Courier chess matured into Koenigspiel, or "King's Game", a chessboard with 1666 squares colorcoded by terrain and pieces named for common military and political actors. Chess remains popular today, and has grown to advanced computer gaming where permutations and scenarios of play are more complex than its inventors could imagine.

Koenigspiel is recognized as the birth of the modern constructive wargame. Wargames are developed for a variety of objectives, which typically emphasize warfighter preparedness. Born from chess-like games, traditional constructive wargames are designed for tabletop play without any need for an internet connection or networked data sharing, making them perfect for environments with heavy security requirements.

We have an imperative to transform how we train and prepare ourselves... we need to adopt an innovative, aggressive apporach to our warfighting development.."

Adm. Christopher Grady, U.S. Fleet Forces Command[1]

1 https://www.executivegov.com/2018/11/navy-looks-to-improve-training-with-live-virtual-constructive-technologies/

Wargaming is used widely in military education. The Air Force uses educational wargames as well, including the LeMay Center Wargaming Institute's SIMWAR engine for teaching combat doctrine and advanced training under the Air Combat Command. The capstone event for Joint Military Operations trimesters at the Naval War College and Naval Academy is a wargame, and naval crews participate in wargames in preparation for deployment. The Marines' Air Ground Task Force Training Program uses realistic wargaming in training for active-duty and reserve Marines.

Analog to Virtual Reality

Simulators and computer networks have led to the newest form of wargaming– virtual. Constructive wargames and live wargames with play-acted combat have provided military advantage for centuries, however the advent of virtual wargaming has enabled deeper complexity. All three types of games can be used together with the right technology. In fact, the U.S. Army trains a large number of soldiers through Live Virtual Constructive (LVC) wargaming at its National Training Center. The Air Force Agency for Modeling and Simulation (AFAMS) is interested in LVC operational training environments to ensure warfighter readiness.

LVC wargames and training simulations are more essential with each advance in technology. As modern warfare infiltrates the airwaves and ground combat becomes more reliant on sensor and joint force communication, military forces have a greater need for fast, distributed, and lower-cost training that can be created at the click of a button. Simple simulations involving a defined and unchanging set of assets and networks provide a good baseline, but the ability to rapidly scale and connect multiple simulators and train across multiple domains is necessary for building a competitive advantage.

DoD modeling and simulation organizations are invested in developing LVC training environments that can be accessed from multiple locations, quickly updated based on changes to the rules of the game or simulation, and able to integrate with systems and simulations between military branches. Interoperability is a major challenge to LVC wargames and training, especially when the systems or simulators being integrated use different communication protocols, send and receive data in different languages or with incompatible timing, and are subject to varying security certifications.

Today's wargames and training simulations need to match the pace of technology maturation. LVC environments demand the flexibility of a smartphone, where warfighters can easily access new resources and connect to real-time simulations and ongoing wargames with minimal delay.

Joint force collaboration and coordination is critical to mastery in modern military exercises. How, then, can the DoD address its barriers to interoperability?

Leveling Up

The National Defense Strategy prioritizes rebuilding the strength and readiness of our military and promoting interoperability in both operational systems and communications. The DoD knows that the wars we engage in today require dramatically different skills and training for warfighters and recognizes that the pace of technology is driving the need for changes in the way its systems are maintained— including those for training and simulation.

Simplifying the integration of new capabilities into simulation environments and configuring connections between them is a huge step towards building the flexible LVC training and wargaming environments we need. Engineers at Tangram Flex are highly skilled in finding ways to make existing systems adaptable so they can be adapted and deployed to warfighters quickly. We specialize in finding the potential in existing systems and making updates scalable and repeatable with our customized integration solutions. We work closely with defense-industry customers, enabling them to quickly bring new capabilities and technology into their programs faster and with high levels of confidence.

Successful LVC wargames and training environments need to be adaptable, with the ability to quickly change simulations and add or remove components with minimal manual work. At Tangram Flex, we work with customers to create tailored toolkits for their systems, allowing users to scale their existing technology and achieve fast, repeatable updates in pace with our adversaries. Interoperability across training environments, domains, and between branches of the military can be resolved with the right translator and security expertise. Our core product, Tangram Pro™, helps you update systems faster by generating secure code for adding or changing components, even providing translations between systems that were previously incompatible. We use advanced testing tools to identify any errors or vulnerabilities before integration, providing confidence that the changes you make won't impact the rest of the system and ensuring that communication pipelines are secure.

Every system is unique, but the mission is clear: the people on the ground need dependable, adaptable equipment and the right training to get the job done. Our team walks with customers to meet this goal.

TANGRAMFLEX

Tangram Flex simplifies software integration for mission-critical defense systems. We understand the challenges of security, speed, and safety. Our team combines engineering expertise with our core product, Tangram Pro™, to arm customers with customized toolkits for meeting mission needs.

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