Team Orlando Strategy for Serious Game Development and Deployment
Peter Smith, Elaine Raybourn, Kent Gritton, Steve Slosser, Leslie Dubow
Team Orlando

Team Orlando exists to achieve one specific goal: “To improve human performance through simulation.” The over 2,500 member strong organization represents all facets of the training community including all four military Services, and the Joint community. Members of the Team Orlando community have spearheaded games for training in the US Government, and continue to set an example that other federal organizations can follow in implementing their own games for training programs.

Over the years the Services have tried many avenues to encourage games for training. Beginning in the 1980s when the Army worked with Atari to build the Atari Bradley Trainer on Atari’s Battlezone platform, there was a willingness to experiment and learn from and with the gaming community. Previous strategies have included funding complete development of a game; partially funding an in-development game to include military requirements; modifying existing games in house; utilizing Commercial Off the Shelf (COTS) games; and our most recent and arguably most successful strategy, building an ecosystem of game development around an enterprise gaming solution.

This paper will focus on what constitutes an enterprise solution, what benefits have been created through this strategy, continuing issues, and new areas that are just beginning to be explored.

Enterprise Solution
An enterprise solution to games is characterized by having a single platform for which games can be deployed. This is not necessarily a single game, but a single suite of games on common hardware. There is, however, usually a flagship game that is used to meet the majority of the game-related requirements. The suite is used to augment the flagship game to allow game based training on alternative hardware, or to meet a different type of requirement.

This strategy has proven to generate an overall cost savings and ROI by reducing the cost of licensing multiple engines, developing multiple assets, and training users on multiple systems. This cost savings has allowed the Services to implement new technologies and refine existing ones to build the best possible ecosystem of development and innovation in the game for training space.

Army Games for Training
The U.S. Army has defined a requirement to support on-demand training, mission planning and rehearsals, stimulation of battle command systems, and Joint interoperability by leveraging COTS and government off-the-shelf (GOTS) applications and advanced simulation technology. The U.S Army was the first Service to adopt an enterprise solution to games. They stood up
TRADOC Capability Manager (TCM) Gaming in April 2008. They selected Virtual Battlespace 2 (VBS2) as an Army gaming program of record and acquired an enterprise license for use throughout the Army. The games are delivered on a common hardware platform and included in the Army Games for Training Toolkit. Using VBS2, Operational Language and Culture, Elect BiLAT, Moral Combat, VBS2 Fires and other games are in the works. Beyond VBS2, games included in the suite all meet Army requirements that are not fully met within VBS2 but run on the same platform. These technologies come from the commercial gaming industry, federal research agencies, laboratories, and academia. Each application has unique characteristics that augment and improve an existing training capability or fill training capability gaps.

The final product for this effort is a gaming tool kit consisting of selected COTS/GOTS applications that fulfill training requirements. The Army will leverage and influence gaming technologies in order to rapidly deliver relevant training capabilities to support current and future Soldier, leader, collective, and mission rehearsal training. The use of COTS/GOTS product portfolio of Gaming Technology is readily available and facilitates our ability to fill operational capability gaps required for training current/future forces.

Gaming technologies provide units with the capability to rapidly introduce lessons learned from combat into a realistic virtual environment to develop tactics, techniques and procedures on critical operations. Gaming technologies provide Soldiers a capability to train under realistic conditions during periods when significant training resources (such as Modified Table of Organization and Equipment [MTOE] equipment or skilled role players) are not available. New training capabilities apply to most Military Occupational Specialties (MOSs) and support collective training for the full range of military operations. Higher echelon commanders and staffs may also benefit from gaming technology within the context of LVC integrated training environment (ITE), for planning, rehearsing, and training.

**DVTE**

The Marines have developed the Deployable Virtual Training Environment (DVTE) as a first person skills sustainment trainer that can be used to train Marines from the individual to the battalion staff by using a simulation network with reconfigurable workstations capable of emulating a vast array of training scenarios. DVTE is resident in most fleet units. The suite contains 32 laptop computers. All of the gear is packed in nine Pelican cases for easy transport and deployment. Each computer contains a suite of tactical simulations capable of training audiences from the individual Marine through battalion staffs. Using DVTE, a unit can set up its own simulation center in a classroom, barracks, berthing space, base, or other location. A unit does not need a simulation center; it can use its own. DVTE is made up of two components; the first is the Combined Arms Network (CAN). The other half of DVTE is the Infantry Tool Kit (ITK), which contains several Tactical Decision-making Simulations (TDS) such as the ROC
series, VBS2, CCM6, as well as other programs geared toward training Infantry tactics. DVTE’s flagship game is also VBS2, but a more Marine focused version.

Many units choose to set up their DVTE suites on a semi-permanent basis in a designated space, such as a classroom. A unit needs trained operators in order to administer its DVTE suite. Operators set up and troubleshoot the DVTE network, know the applications available on DVTE, and know the basic operation of the applications. A unit’s leadership must know how to incorporate DVTE into its training in order effectively employ its DVTE suite.

**Other Services**

While no other Service has officially announced an enterprise solution, they are all paying close attention to the work being done by both the Army and the Marines. There remain many questions about the requirements for an enterprise solution for the Navy and Air Force as the engine must support quality water or air based physics models respectively. Additionally, both Navy and Air Force games for training programs are not far enough along to commit to a flagship platform.

In the future it is expected that current experimentation will lead to enterprise solutions being deployed throughout the military. The idea of a common DoD enterprise solution, however, is still far off.

**Standards**

Enterprise gaming solutions have provided the DoD with a new set of standards for games. Games are now built with target hardware platforms in mind. Assets within the game are built with an existing art style and common tools. Control mechanics can be reused across games, so users do not need to be retrained to control every game on the platform.

**Platform Standards**

Having an enterprise solution to gaming takes pressure off of both the users and developers of games for training. Knowing the hardware and software capabilities allows contractors to determine if they should be modifying current software, in the form of a mod to the flagship game, or developing a new innovative solution that only their software can meet. Either way, they know what hardware platform they are building for.

**Assets Standards**

As the U.S. Army deployed Army Games for Training Toolkit, a large number of assets were built. These assets represent everything from complex terrains to cultural-based clutter and everything in between. The need to develop ten Blackhawk models has diminished, as one model can set the standard. The U.S. Army has developed its own VBS2 Asset repository. This
repository holds all the models used in various VBS2 scenarios. The models have already been reused in a mobile application from Caspian Learning called VBS2 World.

Others in the DoD have taken this a step further and developed the ADL 3D Repository. This repository takes models in their source format and makes them available in other formats. Many Military organizations inside and outside of the U.S. have begun the process of standing up their own 3D Repository instance, and they all federate with the ADL 3D Repository. In the future the ADL 3D Repository is going to be open-sourced and available to anyone who wants to use it.

**Issues**
While the use of an enterprise solution to gaming has solved many problems it has not solved every issue plaguing games for training in the DoD.

**Evaluation**
Games for training in the DoD have not strayed very far from their simulation roots. The evaluation of gameplay is still controlled by a proctor for the game. Players are not going home and learning their tactics, or playing through rich storylines that are common in consumer-based military games.

These games for training are being played in controlled situations that are being monitored. This ensures that the players are not “gaming the game.” This also ensures that the trainees do not end up taking away the wrong conclusions from their gameplay sessions. The risk of negative training is too large to allow soldiers to play alone at their own pace. This is an issue because it doesn’t free the DoD from the need for trainees to come to a common location to participate. It also blocks many of the benefits that gameplay can offer, such as the ability to retry failures, self-moderation and self-paced learning, etc.

Solving these issues will require advancements in artificial intelligence and intelligent tutoring. There is currently a need for automated assessment engines that will not allow players to “game the game.”

**Information Assurance (IA)**
Enterprise gaming solutions are currently deployed on laptop suites that do not sit on military networks. They are networked only with each other. The IA policies for installing and using a networked game on a military network are still a hindrance for the use of games at all levels of the military from training civilians to soldiers. Permissions to install and use games are not being authorized.

Inroads have been made through Flash in particular, but Flash is not robust enough to be used for many of the DoD’s games for training needs. Unity 3D was recently approved for use on both
the Army and Air Force networks, but still requires permission to install. The solution lies in an enterprise solution that can use a fixed set of network ports, where traffic can be monitored and understood by network managers. With an enterprise solution, DIACAP certification can be completed at the platform level. Though, differentiating a game for training from an entertainment game to some will always be a challenge.

Misconceptions of Games
There are still many misconceptions of games for training in the DoD. Many think they are trivial and not suitable for the military. In the past, Services even used different terminology just to avoid using the word game. The Army standing up TCM Gaming has done the most to overcome that. Games have shown that they belong in the training toolbox of the military, but there will probably always be naysayers.

New Modalities
Adopting an enterprise solution has allowed the DoD to spend less time on individual development projects and spend more time looking at emerging technologies. As games have become a part of the existing training regimen, taking them to the next level is clearly part of the Army Learning Concept 2015 as well as the future plans for other Services.

Mobile
Research and development in mobile technologies is on the rise. As handsets and tablets begin getting certified for security, many Services have taken to loading unclassified data onto trainees’ personal phones. The speed at which mobile has grown is unmatched in the DoD. Caspian Learning and Bohemia Interactive have teamed to bring VBS2 Worlds to the iPad as well. Organizations such as Defense Acquisition University have started building mobile games to train the civilian workforce.

Server Side Processing
There has been a return to client server architectures where the games are actually played on the server and the graphics are streamed to the client. These so called “Frame Throwing” technologies are on the cusp of providing a workable solution to many security, processing power, and usability issues.

New Types and Genres of Games
With an enterprise solution there is no longer a need to pursue additional similar engines. For example, if the flagship game is a first person shooter, additional funds can be invested in role-playing, or real time strategy style games. There is also the ability to try out new scenario and behavioral design techniques free from the overhead of developing a complete game system.

Stimulating Small Business and Big Business
These enterprise solutions in the DoD have stimulated a rich ecosystem of game developers building add-ons, scenarios, unique hardware, and other behaviors within and around the flagship game. They have also provided a point of reference for differentiation for new platform holders.

As these systems complete their lifecycle and the project is recompeted, a new generation of development studios is entering the industry. Many established game industry middleware and engine providers are expressing interest in being the next flagship technology. Enterprise gaming has proven to be the most successful strategy implemented by the DoD in our over 30 years of working with games and gaming technologies.

**Conclusion**
The DoD and Team Orlando has found that the best ROI for the use of games for training will come from employment of an enterprise solution; DoD has learned some valuable lessons in employing exactly this approach. In opening a national discussion on the future of games for a variety of key impact areas, it is advisable to explore enterprise solutions. It is further advisable to leverage the DoD’s experience for lessons learned and best practices when embarking on this journey.