

How the U.S. Army Got Game

Seemingly trivial innovations can have a major effect on even large markets

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Apple Inc. CEO Steve Jobs is famous for his flashy, headline-making introductions of innovative new products. While the iPod, and more recently the iPhone, generated a great deal of publicity right from the outset, many innovations are hardly noticed at first.

In fact, often seemingly trivial developments can be harbingers of big change. When a small, regional airline began operating out of Dallas's Love Air Field, no one foresaw that Southwest Airlines would fundamentally alter air travel. And when a guy started selling Pez candy dispensers on an obscure website, few imagined the impact eBay would come to have on a variety of industries.

These stories of course are well-known to most everyone now, but few people are aware of an apparently insignificant event in 1995 that fits the disruptive pattern we've seen before. Working on a shoestring budget, a U.S. Marine Corps lieutenant and a sergeant had a radical idea: To try to alter the popular "Doom" video game, in which players use a variety of weapons to fight electronic foes, for use as a military training tool.

The result was "Marine Doom," a (by today's standards) rather simple video game that could be used to teach soldiers certain skills at a low cost. The developers were hoping to find a way to boost training in an era of significant budget cuts and came up with a cheap, simple, and convenient—in other words disruptive—solution.

Yet, in spite of all of its benefits—and considerable media attention at the time—Marine Doom arrived too early when game technologies were too primitive for serious work like this. The story of why this first effort was unable to gain traction and how in the intervening years gaming has grown into a valuable training tool offers meaningful insights into how small disruptions can ultimately make a big impact.



Source: U.S. Defense Advanced Research Projects Agency

A failed first foray and a successful second effort

Much like the minicomputer industry's reaction to early personal computers, many in the military brass

considered Marine Doom and other early training games distractions from the real work of developing and using traditional multi-million dollar simulation systems to train soldiers.

Although weapons-related games and soldiering would seem like a natural combination, the deployment of games as a serious military training tool has been anything but simple. These low-cost technologies were attempting to disrupt a decades-old, monolithic defense industry that was well entrenched in the purchase processes of the military.

Simply put, using consumer-level PCs and video game technology seemed all wrong when seen through the traditional ways that the Army trained its soldiers. Mid-level officers were used to conducting classroom training, where they would whiteboard scenarios and interact with soldiers. Senior leaders were accustomed to developing and purchasing state-of-the-art, multimillion-dollar simulators that took years to commission and build.

While the chain of command did not embrace gaming, it did not kill it entirely. Faced in 2000 with record low recruiting numbers, the Army returned to gaming to help attract new recruits. America's Army Game, an online video game developed internally that relied on the Unreal game engine created by Epic Games Inc., took center stage in the effort.

The game attempts to simulate the experience of an Army soldier by allowing users to play out a variety of scenarios. Instead of just containing fight scenes, the game tries to educate users about the Army and the various career paths different soldiers can take.

Unlike most war-based video games that emphasize killing enemies, America's Army awards points for factors such as teamwork, responsibility, and good values—traits the Army deems essential.

The goal of America's Army was to attract young men and women to their local recruiting offices. It was a hit. Enrollment went up, hundreds of thousands of people downloaded the game, and the effort became a public relations sensation for the Army.

Why did military leaders embrace America's Army but shun Marine Doom? For one, junior officers who had supported the idea of games-as-training-tools when Marine Doom came out had risen to more senior decision-making ranks and by 2000 were in a position to encourage and fund this new project.

More importantly, America's Army targeted a "foothold" market with much less rigorous standards for acceptance than had Marine Doom. Preparing soldiers for battle is a core function of the military: Any mistakes would have major consequences. This meant that new training tools or processes had to meet to extremely high internal standards.

America's Army, on the other hand, was just a marketing tool. If the product flopped, no lives would be lost and, while recruitment might not get a boost, it was unlikely to plummet either. As such, the project and the final product did not receive the same level of scrutiny from the Army's most demanding users. Like most successful disruptions, this allowed the project to launch and build quickly, identify elements that were successful, and retool as needed.

Having secured a foothold, gaming moves upmarket

The success of America's Army spawned a renewed interest in military gaming and the technology mushroomed into dozens of new training applications. A number of Army organizations began to invest in their own game-based tools, creating training systems for things like learning how to control robots, use new rifles, steer remote-control machine guns, and convey basic "Army 101" information.

The legendary Defense Advanced Research Projects Agency (DARPA), the technology research arm of the Department of Defense that developed the progenitor of the Internet, began working on gaming applications, in some cases in conjunction with private companies. DARPA focused on identifying ways to cheaply and easily adapt commercially available games to meet specific military training needs.

Today, the Army is continuously identifying new opportunities to expand the role of gaming technologies in simulation and training. The long-term goal is to work with smaller commercial gaming system manufacturers and commercial software developers to create new individualized training systems for all soldiers. To get there, the Army is redefining how it trains and educates—and thousands of existing processes and technologies could be disrupted.

One of the biggest successes is Ambush!, a computer simulation game now used in the field by the Army. Ambush! trains soldiers how to extricate themselves from the deadly confrontations that occur regularly in parts of Afghanistan. In fact, troops have embraced the game so fully that one of the main highways in Afghanistan has been nicknamed Ambush Alley.



Source: U.S. Defense Advanced Research Projects Agency

As is the case with most successful disruptions, a number of outside factors contributed to the successful adoption of gaming by the military.

Ongoing improvement of the innovation: In the early years, available games were so simplistic that many people could not imagine using the technology in demanding military contexts. The development of the Unreal game engine and other technologies have allowed richer levels of detail and larger battlefield maps, making simulation games far more realistic and scaleable than the earlier Doom-based games.

Shifting context: The nature of the military challenges faced by the Army has changed from a World War scenario in which large forces of thousands of soldiers are mobilized across countries to more fragmented battles in which a few dozen soldiers fight enemies from one street corner to the next. Current gaming technology is better suited to simulating this environment than are the incumbent systems that created complex, large-scale battle scenarios.

Changing “customer” needs: To respond to current situations, soldiers require individualized training, whether it is teaching a medic how to evacuate a fallen soldier from a street, training an interpreter how to interact with local leaders, or teaching a convoy driver how to spot a potential ambush. Most traditional Army training has tended to emphasize widely used skills, not the customized learning these new technologies enable.

Three lessons

The growth of low-cost gaming technologies in the Army offers a number of lessons about how

successful disruptions can take hold and continue to grow.

Flexibility enables disruptive success

Relative to existing military combat simulators and training tools, video games are simple and low cost. At first, this made the offerings poorly suited to accomplishing the highly demanding and important job of preparing soldiers for battle.

But some in the military did see potential applications and exploited the flexible nature of the innovation to suit a different, less demanding niche: recruiting. Once gaming had significant success in one area, innovators were able to build on this to move into more demanding tiers.

The flexible nature of gaming technologies is altering industries well beyond the military. Linden Labs's Second Life, a self-described "online society within a 3D world, where users can explore, build, socialize, and participate in their own economy," began as an advanced social network where people could use avatars to interact and make virtual transactions online.

For its first couple of years, Second Life predominantly attracted individuals, especially teenagers who wanted a fun place to interact online and did not demand top-end functionality. Because the virtual environment was incredibly flexible, Second Life was able to dramatically improve over time, refining features users liked, squashing those they did not, and providing greater graphics and memory capability.

Now, demanding corporate marketing departments have found numerous uses for the newest version of Second Life. Starwood Hotels is premiering its newest property brand, named "aloft," in the online universe, including undertaking a virtual construction of a marquee building. Dell Computer sells actual PCs through the virtual store, while Toyota allows users to buy virtual versions of its Scion xB to users who want to drive their avatars around the Second Life universe. And finally, both rounding out and summing up the potential of gaming, IBM had a virtual meeting in Second Life to discuss the effects of multiplayer games can have on businesses.

Disruptive innovations come from disruptive suppliers

The Army struggled with this lesson because it had been well served by incumbent, large suppliers for many decades. In the past, these suppliers were able to anticipate the military's needs and to deliver cutting-edge, innovative products and solutions.

But, just as the Army failed to recognize the full value of games as training tools early on, traditional suppliers of military training and simulation systems failed to recognize the changing needs of the Army itself.

For example, one of the great advantages of new PC-based game systems is the high level of detail it offers, which is valuable in simulating street-to-street combat. But established projects, organizations, and investments in technology prevented existing contractors from creating these newer and higher fidelity tools.

Why? First off, existing providers were raking in handsome revenues from improving existing technologies and products, which the military gladly purchased. And, no one would expect a company that is organized to develop high-margin, complicated, costly simulation systems to suddenly prioritize making cheap, inferior solutions. To succeed in such a low-margin market, an incumbent would have to organize itself entirely differently—not an easy task.

In contrast, computer game developers had been cranking up their ability to deliver high fidelity at a low cost for years. These companies are naturally inclined to recognize that high levels of detail are crucial in new types of simulations—it's the same attribute of performance that young gamers in the consumer market have been demanding from video game makers for decades.

Although it may seem surprising that the entertainment industry should be a source of technological innovation for the Army, it is worth recognizing that computer games have become a major industry, with annual sales approaching \$50 billion.

Innovative organizations evolve

When Marine Doom launched, the Army failed to see and build upon the (to some) obvious potential gaming held to improve and lower the cost of training. One reason for this was that senior leaders simply did not understand the potential of the new technology. They were accustomed to purchasing expensive, complex systems that had undergone rigorous analysis, not doctored versions of video games played by teenagers.

What could they have done differently? They could have tried to learn more from the people who were embracing the disruptive technology early on. Soldiers themselves were a great early indicator of the value of the innovation. They were naturally inclined to use games as a training tool because they had grown up playing such games.

The early success of Marine Doom was a signal of change, but this signal was not properly interpreted. It was seen as a distraction from the main business of training and simulation, not as an early prototype that could be embraced, tested, refined, and built upon.

Additionally, the military, like many large organizations, was hindered by an overly complex purchasing system and a reliance on traditional suppliers. Although the Army has tried over the years to court new suppliers, it has been unable to draw a lot of small, disruptive partners for one main reason: The Army is a complex customer to work for.

Smaller companies focused on game technology frequently concluded that the Army was either unwilling to unable to work with them. Decisions were made too slowly for the smaller companies' sales cycles and Army brass were unprepared to make significant commitments.

Within this tension, there is clearly a role to be played by suppliers with a mastery of the disruptive game technologies and a culture of understanding and dealing with the acquisition processes of the Army.

Disruptive forces are unfolding all around America's armed forces. The nature of world threats has changed and the technologies for dealing with those are changing as well. The emergence of game technologies as alternatives to many of the established tools for training is just one of the disruptions that is forcing the Army to adapt to the needs of the 21st century. ♦



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