Seriously Mobile: Downloadable Content in Serious Games

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ABSTRACT

The training and simulation industry has been taking cues from the game industry for quite some time now. So what's the next step? Mobile devices are everywhere, and whether it is a Bring Your Own Device scenario or the device is government-furnished, updating content and new content retrieval continue to be issues. Managing users and controlling permission to content are easily accomplished through the implementation of current gaming technology. This presentation will share with you the effort that is currently being put forth to standardize a mobile application library with a delivery system that works like the mobile apps we use every day, providing downloadable content with a touch when users need it most. As long as users have a connection, they can download updated knowledge and training as easily as they can download new levels of *Candy Crush*.

ABOUT THE AUTHORS

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INTRODUCTION

The training and simulation industry has been taking cues from the game industry for quite some time now. So much so that we have adopted the moniker "serious games" for a wide segment of our training technology. What is the next step, though? The game industry has divided into two very distinct models, each serving its own purpose. The AAA title developed by a large studio with a $60 price point will always have its place, but more recently, smaller companies have been filling a new market gap by developing mobile, iterative games that are supplemented by downloadable content. With DARPA moving to provide its own app store and looking to heavily utilize smart phones through their multi-million dollar Transformative Applications program (Keller, 2013), the way forward for the training and simulation industry is to split its efforts and follow both of these models, using them situationally to match their strengths to the training requirements.

MODELS: AAA VERSUS CASUAL

We start by defining the models and markets for serious games as compared to regular games. Comparing the development styles of AAA and casual games to their serious game counterparts will highlight the best applicable methods for future use.

AAA Model

AAA games, such as *Call of Duty* and *Assassin's Creed*, are easy to relate to standard training programs. Titles like these are usually at least a year in production, sometimes spanning multiple years, and the majority of these products are final.

In the training and simulation industry, likewise, this model predominates. Whether developing a full-mission simulator, part task trainer, traditional courseware, or anything in between, the specifications of the product and training are designed very early into the program and delivered as one final product, sometimes years later. The estimated cost for a single full mission simulator used to train pilots on the new F-35 is around $20 million according to the Air Force's fiscal 2012 budget submission (Majumdar, 2011). With technological advances moving at breakneck speed, the extended time frame required by the traditional model creates an ever-increasing risk of training gaps. This risk can be compounded if the technology targeted by the training is enhanced after development has begun. If a vehicle gets a new radar system or if a procedure for operation is modified while training is in development, problems arise.

Casual Model

The casual development model provides for much more flexibility and a much quicker development cycle. Iterative development can provide a base game or application while supplementing it with new content or levels as necessary, known as downloadable content (DLC). Games such as *Candy Crush* use this model and push new levels to the user as they are developed. Even larger established game studios like Capcom are taking these cues and moving to shorter development cycles in favor of supplying more DLC down the line (Purchese, 2012).

Now imagine this model in serious games. The customer very quickly gets a game or application that he or she can put to use in training, then new content is added as needed, requested, or scheduled in the development schedule. If a new system is implemented or a procedure is modified within the training, it too can be changed later in the development cycle. Granted, the initial delivery will not be as robust as the final delivery of a AAA model, but the flexibility included in this model, coupled with the opportunity for future product enhancements as incremental changes, makes this model much more advantageous.

MOBILITY

With the rise of the smartphone, games were distributable to the masses wherever they were, on the fly. A user could make a decision to play a game and within minutes have that game ready to go on his or her mobile device. This created an untapped market for the game industry. Even casual games at that point were considered outside of the mainstream, and no viable profit model had yet been created for such a thing. However, as these competent machines grew in popularity and were rapidly distributed throughout the world, the industry had to adapt. Successful AAA game company Electronic Arts recently reported that its DLC revenue was on course for hitting $1 billion (Xicota, 2014).

Downloadable Content (DLC)

There are two main strategies developers can employ to successfully implement DLC.

The first strategy is creating new content and providing it for additional cost. This content could take the form of new levels, new storylines, or, in the training world, new courses or scenarios (DLC, 2012). Users are already invested in your game or application by this time. Whether they are having fun playing the game, or they have found the product to be a useful training tool, at this point, they are ready for more. Instead of then making users download a new application, buy a new game, or go through an entirely new contracting experience, the option is provided to access this new content at the push of a button.

The second strategy is supplementing the content by providing enhancements or customizations through DLC (DLC, 2012). In the game industry, this supplementation could take the form of buying power-ups or tools to use in the game (e.g., a package of striped candy pieces in *Candy Crush*). In the training and simulation industry, it could be anything from updated content modified for enhanced operation, to new tools such as an x-ray view to better understand the maintenance and operation of an aircraft engine.

Mobile Devices

Mobile devices and the technology they hold are growing at an extremely rapid pace. With such fast-paced growth in the industry, price points are dropping. The height of technology two years ago has become very affordable today and is more than capable of running advanced applications, so that even an entity on a strict budget can have access to the latest games or training.

As flip phones met their demise, the world has feverishly adopted smartphone technology, putting this technology in the hands of the average person. Regarding training, given mobile technology's near ubiquity, a Bring Your Own Device (BYOD) scenario is perfect for app distribution because the content can be pushed directly to users' phones, allowing them to have all of their training content on a device that they carry at all times. While security issues would be a main concern with the BYOD method, this would also provide significant savings on the acquisition of new technology for young servicemen and women (Tadjdeh, 2014).

Another option in training is to distribute devices to users. This approach allows strict control over the content on the device, including pushing the proper DLC or even preloading when necessary, providing a more secure environment. This option also allows for reusability of the devices for new training classes but takes away any opportunity for ongoing training or future access to DLC by former students.

TRAINING NOW VERSUS TRAINING LATER

With this newfound mobility, there is now the question of how much the student can learn outside of the classroom. Using the old model of one final deliverable, the possibilities are limited by the extent and timing of the program's execution, whereas using a model that includes DLC provides for endless possibilities and updates to the training content.

Training in the Classroom

Training in the classroom can be easily augmented by mobile applications and DLC. As an instructor is teaching a certain subject, he or she can push relevant material to the students' mobile apps, thereby increasing the likelihood that they are following along and "on the same page." In the same vein, since the technology is so powerful, the instructor can push not only simple content to the student, but also versions of a part task trainer to train on a system being covered in class at that moment.

Training Wherever

The ability to push new content through DLC opens up new possibilities for distributed training as well. Students can access the information they need from anywhere at any time. They can train at home, in the field, or anywhere in between with a mobile system, but adding DLC allows them to train on specific, updateable, and revisable material to be more effective.

DIGITAL LIBRARY

"I think the issue in the tactical environment is always going to be one of constraint of resources. In the tactical environment, what we're trying to do is give [servicemen] the ability to have the information they need when they need it."
–Maj. Gen. Stuart M. Dyer (Tadjdeh, 2014)

In effect, the DLC provides a digital library that students can sift through, downloading what they need at any moment.

Push Modifications

One of the main advantages of a digital library of DLC is the scope of modifications. In the past, any time that a modification was made to a weapon, procedure, or any other module, a change to every instance of that event was required. In a digital library, that change can be pushed to every mobile device containing that module and updated automatically.

New modules are also immediately available through the DLC library, providing quick access to approved lessons or models as they are developed.

Digital Library in Practice – Virtual Firearms Interactive Training Environment (VFITE)

Adayana Government Group is currently developing a Virtual Firearms Interactive Training Environment (VFITE). With VFITE, students can access a variety of weapons or lessons through the base application. Initially, the application is an empty library, but the DLC is the unique aspect here. Any time students want to download a new weapon, lesson, or scenario, they simply go to the DLC library and choose the option that they require. As long as they have the correct permissions (as set by an administrator), that content could be on their devices in just a few seconds.

As the digital library grows, content will increase and eventually the size of the library may get heavy for a mobile device. Because the actual digital library resides online as DLC, users can easily delete a module that they no longer need, freeing up space on their devices for other things.

This application runs cross-platform and since it stores every module individually, the purpose and permissions can easily be adapted per the agency, training company, or class via a username and password. The individual modules provided by the digital library allow branches or agencies to prevent multiple payments for the same content.

USE CASES AND RECOMMENDATIONS

While the use cases are many for DLC and digital libraries for mobile applications, there are a few that really stand out.

Peculiar Weapons Training

Students may have been trained on multiple common weapons in the classroom, but what happens when they have to use a new weapon in the field? They can try to figure it out on their own, or they can download that module from the DLC library on their mobile devices.

This DLC will provide them with a 3D model of the weapon as well as detailed operation, assembly, and disassembly instructions, allowing them to access the information they need to become successful in the field as quickly as possible.

Revised Operational Training

Using mobile reality goggles is a great way to familiarize an operator with the area of operation before insertion. If a target building is "experienced" through virtual reality before the mission, chances of success on the actual mission will increase.

With a low-cost smartphone, an operator in flight to the mission could rehearse in the virtual world. The operator could download the scenario module from the DLC digital library, drop the smartphone into the goggles, connect a controller with Bluetooth, and he or she would be ready to experience the virtual scenario. While this technology has all been in development at DARPA using Oculus Rift, Google Glass, and Samsung Galaxy Notes (Estes, 2014), what happens if new intelligence comes in or the target building changes?

With the DLC digital library, modifications can be quickly made on the main file that will then be pushed to the mobile device, in this case on an aircraft in a remote area, where the operator can quickly download the update and rehearse the mission with the latest intelligence.

Meanwhile, this whole solution can be so cost effective that if the mission required a certain level of discretion, the entire kit—goggles, controller, and mobile device—could be disposed of at a loss of just a couple of hundred dollars.

DISCUSSION

The Latest Training at the Push of a Button

Downloadable content in serious games provides the most up-to-date training content at all times, putting the control in the users' hands so that they can train anywhere, at any time. Programs will need to consider whether their training objectives require full mission simulator type devices, or whether they can be trained in a more intimate immersive environment while keeping in mind security requirements and distribution options.

Creating a large database of modules to choose from will also give users immediate access to training on any requirement they might have in a time of need, while central database repositories will allow the armed forces to reduce their production budget as they cease to reproduce assets that have already been created by a fellow branch.

Implications for Training

A 2013 study with 500 Learning and Development staff shows that 70% were either already using or planning to introduce mobile learning by 2014 (Overton, 2013), while a 2011 survey said that 70.3% of students were shown to prefer learning through their mobile device (Yilmaz, 2011). It is a widely accepted fact that Millennials—who are estimated to make up close to 50% of the workforce—are highly mobile and need to be engaged with quick and efficient training (Hill, 2011). Mobile training with the addition of DLC can provide highly engaging material, changing at a pace appropriate for training this generation.

Implications for Military Applications

DARPA has launched multiple programs aimed at developing a pervasive military wireless network to support mobile devices (Ante, 2012) and protecting military wireless networks (McCaney, DARPA Moves ahead on protecting military wireless networks, 2014)**,** while DISA's latest five-year plan involves a heavy focus on mobility and a secure, interoperable cloud infrastructure (McCaney, DISA plan outlines a mobile, cloud-based military, 2014).

These events, along with DARPA's effort to create an app store, create a ripe environment for mobile learning. Associated military budget constraints mean that when a single application can run multiple, high-quality training scenarios pulled from a DLC library or developed as needed, it will be the most effective, cost-efficient training available.

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