

Interaction Design for Entertainment Software

Individual Report

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Table of Contents

Specification of the Game Objectives.....	3
Focus on Gameplay.....	3
Fun for All.....	3
Stylised Graphics.....	4
User Audience and Design of the Interaction.....	5
Common Entertainment Values across Generations.....	5
Simple Graphics.....	5
Topical Music.....	6
Easy Controls.....	6
Tools, Technologies and Algorithms Developed for the Game.....	7
Unreal Engine: Editor v Development Kit.....	7
Asset Management.....	8
Unity Engine.....	8
Assessment of the Design Qualities of the Product.....	10
Aesthetics.....	10
Levels and Progression.....	10
Engagement.....	10
Approaches to Evaluation of the Product.....	12
Evaluation Goals.....	12
Evaluation Methods.....	12
Assessment of the Group Performance.....	13
Management.....	13
Group Performance.....	13
Notable Individual Performance.....	13

Specification of the Game Objectives

As the principal designer for this prototype the objectives for this game were very clear from the start. This was important to me as I did not want to start working on a prototype that did not have a solid foundation from which to build.

Focus on Gameplay

The first aim was to make the game as simple as possible in order to allow us to focus more on gameplay and it being fun to play instead of focusing on trying to break boundaries in terms of innovation. In my opinion there is plenty of scope within the boundaries of current technologies to produce entertaining games - this has been proven throughout gaming industry starting with what are now called "retro" 8-bit games of the past to Flash games, indie developments and the titles released on the Nintendo Wii.

The majority of successful game studios today are focusing their interests on producing visually stunning, thought provoking and clever products for which there has always been a market for¹. In many cases they resemble, even take expertise from, the film industry. For example one of the more recent titles, Call of Duty: Modern Warfare 2, has generated scores of praise for its impressive visual quality and set pieces, criticism for introducing a morally questionable scene and has a sound score written by the well known film musician, Hans Zimmer. These are all very impressive qualities but in the pursuit for these attributes some critics say that gameplay has (or at least had during the late 90s and early 2000s) been sacrificed which compromised the whole point of gaming in the first place. As a result a void has been left behind for simplistic, stylised and fun games.

This prototype we have produced is an example of such a game that would fill this void and this type of game has been proven to be very successful: new titles such as Mini Ninjas and even re-released classics such as Super Mario Brothers Wii have made major profits². Even games that don't require payment such as Flash games found on sites like Newsgrounds or mini games such as Mafia Wars found on Facebook prove time and time again that there is a demand for simplistic yet engaging games.

Fun for All

The other objective of the game was to make it fun to play for as many age groups as possible. This is due to personal observations and a shift in the typical demographic of gamers today. Children often want to play with their parents in any game (whether it is on a computer or not is irrelevant) but this seldom occurs mainly because the parent becomes bored with the game very quickly as it is too simplistic or not particularly interesting. A couple of years ago I was amazed at how both my uncle and nephew were fully engrossed in Lego Star Wars over the Christmas period. This proved to me that there is a market for games that appeal to both older and younger generations of gamers. This has been further bolstered by the fact that the typical age for gamers today has risen³. As younger generations will always embrace games this means that past

1 And always will be

2 As of 13th January 2010 10 million worldwide sales, an estimated \$610 million revenue (VGChartz, New Super Mario Bros Wii Hits 10 Mil, Beats Sales Records (Patrick Maxwell) <http://news.vgchartz.com/news.php?id=65440&mp=1>)

3 Jupiter Research Finds Major Shift in Gamer Demographics: Console Audience "Grows Up" While High Intensity User Base Expands and Leads to Unexploited Opportunities for Developers, <http://www.webmediabrands.com/corporate/releases/02.11.06-gamerep.html>

younger generations, who have now grown up and possibly have children of their own, are still playing. As a result for the first time in this medium there is scope for products that are entertaining for both younger and older generations.

This prototype uses the idea of time travel which is always popular for all generations. The viewing figures for a Christmas Doctor Who episode or any of its spin off shows are evident of this⁴.

Stylised Graphics

The final objective for this game was to give it a stylised artistic appearance. There are three reasons for this. The first reason was due to logistics within the group - we only had one animator so I was determined to make sure that whatever was required of him he would be able to turn out the results quickly and not run into a situation where missing assets were needed at the last minute. The second reason is to increase the longevity of the product since those with stylised graphics tend to remain attractive to gamers for longer. The final reason is to make it recognisable. As stylised graphics are entirely due to the creativity of the artists or designers they can instantly be recognised when compared to other products. This is the same approach that Matt Groening took with the Simpsons - the characters are mainly yellow to attract the attention of channel hoppers. If the approach had been to make the graphics as realistic as possible it would be lost in the swarms of other games trying to accomplish the same goal.

⁴ The End of Time – Ratings, <http://gallifreynewspace.blogspot.com/2009/12/end-of-time-ratings.html>

User Audience and Design of the Interaction

Common Entertainment Values across Generations

As mentioned in the previous chapter the game has been designed to be entertaining for all age groups. Therefore in order to achieve this goal we had to combine the different ways in which each generation are entertained and this is no better realised than through comedy. Good examples of this unique combination is the humour found in the Simpsons television series and the Austin Powers films, the latter of which we drew a lot of influences from. Both mediums provide the same mix of slapstick humour for both younger and older participants but there is also either historical, political or social references that only the older generations would understand. As (hopefully) younger gamers would find the game entertaining by default through the gameplay itself it was these extra references that required an equal measure of attention. Fortunately time travel provides ample scope in which to make these references and would possibly work even better thanks to recognition and even nostalgia.

For the prototype we settled on choosing London in the 1960s for the level as it was an iconic period of history, bolstered not only by living memories of the time but also by the recent Austin Powers films. Although heavily stereotyped the films provided a good spring board from which to draw many themes and ideas as part of the success of the films can be attributed to the wackiness found in the over-the-top mannerisms of the entire cast. It also combined the perfect and essential mix of comedy styles to meet the requirements of all generations.

Simple Graphics

With regards to the stylised graphics we again looked for a simplest way in which to represent the elements of the game. We quickly opted for a cartoon approach arguing that we would then not have to worry about realistic textures, lighting and other attributes which would take considerably longer to create. It would also allow us to be somewhat liberal with the overall look and feel of the elements such as using primitive shapes as oppose to Bezier Curved surfaces. Finally, as mentioned in the previous chapter, it would ensure that the look of the game would become ageless. This is due to the fact that for each generation of consoles or GPUs⁵ a studio will release what is considered at the time to be the most realistic representation of the world possible. However as soon as the next generation is released (which is often only a matter of a few years) the graphics quickly begin to look dated and put off players. This was one of the main complaints towards Valve when they re-released Half Life on their Source engine which was being used to power their then new release of Half Life 2. Gamers had expected the classic game being remade to utilise the full power of the engine with near realistic graphics and physics engine but instead were presented with a conversion reusing all the old textures and assets. As a result nobody plays it (if anything they replay the original game instead⁶) and there is now a near completed mod⁷ of Half Life 2 which is a complete reconstruction of the model (Black Mesa Source).

⁵ Graphic Processing Units

⁶ Go to <http://store.steampowered.com/stats/> and click "View Steam players per game". Half Life (the original) appears in the list but Half Life:Source (the remake) does not.

⁷ Short for "modification" - an original game is modified in order to be played differently

We also opted for a reduced limb model for the characters in that we would only require the torso and extremities (head, hands and feet) of the characters. Not only would this reduce the amount of modelling required by the animator but also the amount of rigging for the animations as elbows and knees could be anywhere they wanted so long as the whole animation looked more or less correct. This technique has been used in several platform games such as Crash Bandicoot and Rayman. We even further simplified the model in such a way that the animator could quickly create new similar models by only changing the texture of certain parts.

Topical Music

Gameplay and graphics are not the only things that can immerse a player in a game. Recent game successes have proved that there is a market for games that incorporate a good selection of music (either to fill the background⁸ or to interact directly with⁹). More interestingly games that have involved music from the real world tend to sell well or at least better than those with custom made music¹⁰. As a result we decided to include periodical music into each level further adding recognition or nostalgia for older players. It also introduces the younger generations to new avenues of music they otherwise would not necessarily have encountered before. Again it was not difficult to find a good selection of materials for the prototype level as many considered London to be the epicentre of culture in the 1960s.

Easy Controls

As the game was intended to be used by players of all age groups and we also wanted infrequent or new gamers to be able to play. We therefore could not allow it to have a complicated control setup and as such the game had to be limited to the basic movements (forwards, backwards, turn left, turn right and jump) and a single interaction button. On console controllers this is adequately covered, whether the movement controls are dictated by a stick or 4-way brick button. In hindsight, PC gamers may have found the lack of controls frustrating and perhaps confusing as it would be reverting back to the controls found in early FPS¹¹. In the original design and pitch of the game we were convinced that this could be ported to any platform possible including mobile phones. As time progressed however while it could possibly be ported to some hand-held consoles¹² I suspect it would not convert well to current mobile phones.

8 Such as Hans Zimmer providing a musical score for Call of Duty: Modern Warfare 2

9 Such as AudioSurf

10 Guitar Hero allowed players to participate in songs they knew and the later Grand Theft Auto games feature songs from well known artists in the music industry

11 First Person Shooters

12 Such as the Nintendo DS

Tools, Technologies and Algorithms Developed for the Game

Unreal Engine: Editor v Development Kit

When we started the project we quickly agreed on using the Unreal engine for developing the prototype but possibly develop a bespoke engine for the full version. There were three principal reasons for this choice. Firstly there was sufficient experience in the group to use this engine: one of our group had used the engine in a previous exercise for a similar type of game. I also had previously used a similar tool set¹³ and understood the basics of constructing levels. Secondly the Unreal engine was readily available at the university and we considered it to be ignorant of ourselves to not make use of it. Finally the Unreal engine is a popular engine and would be useful to have on our curriculum vitae, particularly for programmers where there is considerable demand for those who understand its scripting language, UnrealScript¹⁴.

Soon after the project began Epic Games (the studio behind the Unreal franchise) released the Unreal Development Kit (UDK), the principal tool used by studios when creating original titles, for free as a download on 5th November 2009. This at first seemed like a bonus as it included several extra tools¹⁵ as oppose to relying on the standard Unreal game mechanics. As such I downloaded a copy of the UDK and began development of the prototype.

During development I sought help from a series of video tutorials on how to use the editor. Strangely the video tutorials did not quite match the tool I was using which I dismissed as minor changes between different releases - it was still possible to follow the tutorials but not as clearly. Unfortunately when I came to present my work at the next group meeting it was impossible to open the file using the standard UnrealEditor, which is what the university provided. This was confusing at the time as it seemed to make no sense as to why a map from the full development kit should have a different format to the standard editor.

The facts that the tutorials available on the Internet did not quite match the tool I was using and that the standard editors provided by the university could not open the generated file prompted to me to find out more information about the UDK. The unfortunate truth is that the UnrealEditor (provided by the university and in copies of the Unreal Tournament games) is designed to generate mods of Unreal Tournament whereas the UDK is designed to generate an entirely separate executable but using a configurable copy of the Unreal engine. This was incredibly frustrating as I would have to rebuild what I had created from scratch as it was impossible to import/export relevant files from one to the other.

I would normally have put this off to unfortunate luck but the fact is that I found the Unreal tools (whether it was the UnrealEditor or the UDK) to be incredibly cumbersome and sporadic in performance. I am almost certain that the engine itself is excellent in its capability but the development tools associated with it prevent it from being fully harnessed either through inconsistency or over restrictive controls.

¹³ Valve Software's Hammer Editor

¹⁴ A bespoke hybrid of Java and C++.

¹⁵ Speedtree, Bink Video, FaceFX and PhysX

The main complaints I have about the Unreal products are:

- In any software design mentality, especially when it comes to GUI¹⁶ and HCI¹⁷, is to provide easy access to the most commonly used functions. With the Unreal products how long your activity would take depended on the activity itself and not whether it was a common practice. Some repeated tasks took considerably longer because the function in which to complete was buried in a myriad of drop down menus, tabs and lists.
- Fortunately we were using the more stable version of the Editor but that did not prevent the product from inexplicably crashing either when a map was loaded, performing light calculations or saving modifications to asset packages.
- The lightmass calculations would only work if the Java service (which is now installed on the vast majority of Windows machines) was turned off.
- There is virtually no official documentation¹⁸ or explanatory notes on how to use the engine nor does the software itself provide any indication (such as tooltips) on what a particular function does. The vast majority of documentation that is available is provided by communities of mod developers providing subjective tutorials on isolated cases of usage and not the principals of the functionality.
- It was impossible to select multiple elements (to modify) that all shared a similar property such as the use of a particular asset.

Fortunately I think these problems can be resolved easily if Epic spent more time on refining their products and perhaps took on a more mature approach to its software development practices. I certainly think it would prevent another situation like the current court proceedings between Epic and Silicon Knights¹⁹.

Asset Management

During development it was difficult keeping track of progression and managing assets. Had the project been a typical software development exercise where the majority of work was contained in programming files I would have demanded that the group used a version control system such as CVS or Subversion. As a group we set up an online repository using Microsoft's Sky Drive which had its own limitations (such as a maximum upload of 50MB) but it allowed us to centralise our efforts. However this did not resolve the issue of version controlling and keeping track of progress other than by looking at a file's last modified date. Professional game studios get around this with the use of asset management servers such as the ones provided by Alienbrain which unfortunately come with a high cost²⁰.

Unity Engine

In hindsight I think the group would have fared better using the Unity engine for a number of reasons:

- It is primarily designed for making less processor intensive games such with a specialisation on

16 Graphical User Interfaces

17 Human Computer Interaction

18 At best there is a Wiki which is still being populated as part of a version releases for the UDK

19 http://en.wikipedia.org/wiki/Too_Human#Unreal_Engine_dispute

20 AlienBrain's Studio Pack costs \$99,000

producing titles for the Nintendo Wii (which would have provided a perfect customer base for our prototype) and Apple phone.

- It includes a bespoke version control system.
- It uses Javascript as its scripting language. The language choice is irrelevant but the fact that it is an openly recognized language is better than a closed source bespoke language.
- It directly interacts with external tools such as 3D Studio Max and Maya again unlike Unreal where a conversion has to take place in between.
- It is well documented through the provision of an official tutorial site and bundled help files.

Assessment of the Design Qualities of the Product

Aesthetics

The entire game is based upon stereotypical cartoon representations of characters and environments. This is to make the game approachable to younger gamers while also providing older gamers with a comical familiarity within the game. It was important for us to make this game appealing to a wide variety of games and I think the approach taken has worked. The additional objective was to keep the style simple. This provides a three principal advantages:

- the game does not compete with realistic graphics from any genre or time
- the development times for the assets is significantly reduced
- any further or modifications to any of the assets would not incur any massive costs. This in turn allows significantly more scope for different versions

The resulting style of the assets created have definitely met the criteria that we specified in our concept designs and have successfully generated a fun looking environment in our level.

Levels and Progression

The levels that would make up the game represent different locations and time periods. This allows us to introduce a wide variety of different surroundings for the players, all of which could be produced using a stereotypical style approach as can be demonstrated in our first level. Each level is aimed to be progressively harder and later challenges would draw on experiences from beforehand requiring a mixture of different skills to complete them. This would ensure that the player, whatever their ability, would be able to progress through the game at a manageable rate and would not introduce, with too much of an unfamiliarity penalty, overly difficult challenges.

Each level in turn is broken down into sections with checkpoints for the player to reach. This is to allow the player to repeat sections of a level without the risk of losing all their progression for the current level. Normally games, such as the Mario and Sonic franchises, provide checkpoints but they ultimately return the player to beginning of the entire level when they have run out of lives. While this tactic is fine for regular gamers (since it is a recognisable penalty) it is incredibly frustrating for new or casual gamers and can easily put them off from playing as they want to play without risk of failure.

The level we have developed is aimed to be an introductory level where the player is explained basic concepts such as how to move the player and the overall objective of the game. As a result our decision for the first challenge for the player to be simple maze is appropriate as it allows them to safely learn the necessary skills for further gameplay.

Engagement

The game provides many opportunities for player interactions including the puzzles themselves, the environment (such as the NPCs, music and locations) and educational pickups that allow the player to better

understand their predicament. While not all the items that can be interacted with are necessary towards the player's progression through the game they heighten the experience and can be seen as bonuses to core gameplay such as the vinyl records which provide an educational pop-up. The general pace of the game is also expected to be determined by the player themselves except for when puzzles include a timing element. This allows gamers of different abilities to enjoy the game at their leisure whether they want to speed through the game or savour the environment.

Approaches to Evaluation of the Product

Evaluation Goals

The objective of the game is to be fun towards a wide target audience that will vary in age, gender and gaming experience. This is essential as it is the main selling point of the game due to the simplistic style approach of the level and asset design. It also has to be entertaining when providing a multi-player experience such as co-op²¹ as this game would most likely be played in the following situations:

- both players are younger gamers
- at most one player is an older gamer

As such the humour that is provided within the game must appeal to all audiences but for different reasons and within either moral or national media standards²².

Evaluation Methods

I would consider two methods to evaluating as defined in Interaction Design: beyond-human computer interaction²³: "Quick and Dirty" testing and Usability testing. In each test it would be imperative to include a wide demographic but split into varying degrees of gaming history as I suspect those with more experience in gaming would produce drastically different results²⁴ due to different expectations towards what accounts to be entertaining.

I would suggest performing "quick and dirty" evaluation at regular intervals for the entire product during development and also immediately after a new level was completed. While this could be costly it would be a worthwhile investment in the end as the game relies entirely on its entertainment value to be kept at a high level and would suffer greatly in approval if this were not maintained. It would also help to keep development on the right path ensuring consistency throughout the product.

Usability testing should be done less frequently but should certainly be more thorough in data collection by looking at key presses, general opinions and reactions during gameplay.

21 Co-operative play

22 Such as those provided by OFCOM or PEGI

23 <http://www.id-book.com>

24 Such as progressing through the levels at a faster rate and/or overcoming challenges more quickly

Assessment of the Group Performance

Management

As the prototype was based on one of my ideas I took responsibility for the management of the project. I also have commercial experience of working in small development teams and I wanted the opportunity to learn the challenges of leading a team.

As the project leader I asked the team to meet on a weekly basis so that we could catch up with each other on our progress and establish our goals before the next meeting. This proved to be a successful tactic especially early on while we were finalising the design for the game itself and establishing what assets would be required. Additionally I distributed minutes for each meeting via e-mail and our online space for two reasons: to establish what had been achieved so far and to remind ourselves what was required for the next meeting. During the middle stages of the project however (end of November to December 2009) these meetings started to have less use as we had entered the actual development phase and the majority of the team could not do any more work until assets had been produced. As a result our last meeting was held on 19th November - this coincided with a time when the programmers had approximately four assignments to hand in and could not dedicate much time to this project.

Group Performance

Since the group consisted of one animator and three programmers it was difficult to distribute the work evenly as the programmers required the animator to complete several of his tasks before commencing their own. However as more of the assets were completed work could begin on compiling the components together and the work flow became more balanced.

Notable Individual Performance

The sole animator in our group always provided fantastic work for the project. His experience of the Unreal engine proved to be invaluable to the project and the assets he created were always to specification and of very high quality.