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Abstract

ARGs are a form of storytelling that make use of multiple different platforms, help advertise products and test peoples’ skills. Due to how not much actual programming is necessarily needed they are one of the easiest forms of games to make but there is next to no information on what the best practices are to make a good ARG.

ARG HandbooK

What makes a good ARG?

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# Introduction

An ARG – meaning alternate reality game – is a type of game that is like a mass scavenger hunt that can span across any form of media (going from the web to a physical book and then to a real-life geographical location as an example). These games can often be very cryptic in nature and can sometimes be used as a marketing tool to build hype around a new release, a form of recruitment to test people’s abilities in a certain field or can just be for fun and have no real goal – essentially a wild goose chase.

One of the main reasons people are drawn to ARGs is because it feels real. Players are looking at real websites, real social media pages, it is a way to tell a story that helps fully immerse the player into this alternate reality that makes them feel as if they are living there due to how much of our actual reality is included as part of the game and story. They often make people feel as if they are discovering something new, they were completely un-aware of for their entire life until now – a similar feeling that people have when they first play exploration games like Minecraft: entering a world that is completely unknown to you, yet it still feels familiar enough that the player doesn’t feel alienated.

Since ARGs alter the player’s reality, this means that they can be really useful for advertising. Mass participation in these ARGs will result in people talking about the puzzles and the story as well as who it was made by can be used as a way of advertisement and building up hype for a new project. For example, the artist Underscores made an ARG to promote her album Wallsocket by releasing snippets of newspapers for her fans to find which tell a story that the album is also telling. Another quick example of an ARG being used for advertisement is one made by the BBC to promote the 13th series of Doctor Who which had fans looking through the show’s social media pages for hidden clues leading to websites which slowly revealed hints as to what the story will be. Using an ARG as advertisement can also help the makers to track and monitor how interested people are in an upcoming project.

Companies may also use ARGs as a form of recruitment as puzzles can be designed to test specific skills that an employer might be looking for as well as testing their commitment to tasks to see if they are the right person for the job. Companies may also make an ARG for their current employees to play as a team building exercise, making people with different skill sets work together to complete a puzzle in a way that is engaging and can also be quite fun.

ARGs are possibly one of the easiest games to make as they don’t always require much technical experience to be made. Someone can easily make a TikTok or an X (formerly Twitter) profile and start leaving clues to web pages that other people have already created, essentially using pre-existing re-sources and building an alternate reality around them. Even if they wanted their ARG to have its own website, there are tons of places that someone can go where they can make a website without needing to actually build one (such as Weebly).

Even though it seems quite easy to make an ARG, making a good and engaging ARG is a different obstacle that can, to some, seem impossible to overcome. Most of the criteria for creating a good ARG is the same as creating any other game: have an interesting and engaging story that is also a fun and enjoyable experience however since ARGs aren’t traditional games, they have a few more extra guidelines, which no-one really seems to talk about. Compared to traditional games, there are loads of places that have found semi-concrete principles of game design that almost every should follow if it wishes to be successful, but there doesn’t seem to be much knowledge on what makes ARGs enjoyable and fun because they have such a large playing field.

Some issues that people could face when making their own ARG is making sure the puzzles aren’t impossible to solve but also not incredibly simple that people feel like the game is holding their hand. Puzzles also need to be relevant to the narrative and lead somewhere that further progresses that narrative. While these also apply to traditional games, they are extra important when making an ARG as people may not bother traversing the internet if they aren’t enjoying themselves - since ARGs tend to be free to play, players may not feel as if they have lost anything compared to traditional puzzle games which may have been purchased and people want as much out of their money as they can get. Other obstacles that people may face when creating an ARG include whether or not to have the player leave their house to look for something, with people’s varying skill levels, how many different parts of the internet should the player be sent to?

When looking around for answers to these problems, not much can be found. There are places that people can visit which may point them in the right direction but there’s nothing concrete, no simple Do’s and Don’ts list that says what core features are important to an ARG and what makes them enjoyable.

Given the nature of how these games are made, it can be difficult to successfully make one that is not only challenging but is also fun and enjoyable for the player. Due to how many factors need to be taken into consideration, it is fairly difficult to make an ARG that is considered “good”. Not only that but there doesn’t seem to be any information on what to do to make a good ARG: there’s no handbook, there’s not much academic research, there’s nothing to say, “do this but don’t do that”. All people have is prior examples which may not always be completely useful.

# Aims & Objectives

The aim of this project is to investigate ARGs and create a short list of principles that make a good ARG. This will hopefully help people who are interested in making ARGs make sure that their ARG is engaging and fun to experience

## Objective 1

The first step is to research existing ARGs that have already been made and examining then to see how they are solved. These ARGs will range from traditional story telling games to forms of marketing, each having unique differences that set them apart from other ARGs as well as fairly well known examples of what an ARG is. They will be compared with each other to see what they all have in common as well as what sets them apart and a list of core principles will be proposed.

## Objective 2

To test to see if these core principles are indeed what makes an ARG fun and enjoyable, an ARG will be made that will incorporate as many of the pre-established principles as possible which will them be given to people for them to play-test where they will give feedback.

## Objective 3

A selection of people will be gathered to play-test the ARG made and provide feedback on the puzzles included in said ARG and they will also be asked if certain features would have made the game more enjoyable or not. These results will then be compared to the original core principles to see if they were correct or not and a new list of principles will be made based off all the information that this project gathers.

# Background Research

From an academic perspective, ARGs have been seen as very intriguing. A paper by Jeffrey Kim (2009) states that organisations, non-profits, schools and government agencies could use ARGs to easily bring people together to help each other solve problems and potentially be used as a recruitment exercise. However, ARGs have also been used in schools as it can help young children practice their problem solving skills due to the various puzzles that must be completed.

Perma-ARGs are a type of ARG that aren’t connected to any form of live event meaning that they can be played and solved at any time a player chooses to. Most ARGs are connected to some form of live event which can result in some players missing the chance of being able to play them. These ARGs tend to be more story focused, self-contained using ARG tropes & puzzles and don’t really serve any other purpose other than just being a fun experience and an alternative way to tell a story. Some examples of perma-ARGs can include: Five Nights At Freddy’s: Help Wanted, Shipwrecked 64 and UFO 50.

One of the first influential ARGs to surface was a game called The Beast by the developers was made to help promote the movie A.I: Artificial Intelligence (2001) and had over three million players across the entire world spanning hundreds of websites as well as players getting emails and phone calls which inspired many participants to create their own ARGs.

Perhaps one of the most well-known ARGs is Cicada 3301 who’s cryptic messages and complex puzzles had the internet gripped for almost the entirety of the 2010s. While not much is known about who created it, some people who were contacted by Cicada reported that they “had to answer questions about what interest you had in encryption” (Daniel Tucker, 2013).

These are two short examples of ARGs that have made an impact on the genre and shows how they can be utilised by organisations. However, this project is about what makes a good ARG. The next three chapters will be focused on specific ARGs, looking at what puzzles they contain and how they can be played.

It is worth noting that while researching for this project, a website was found that offers free practice or “training” for ARGs. GameDetectives.net describes themselves as “an extensive, growing archive of information about ARGs” (Gamedetectives.net, 2018) that seems to act as a place where ARG players can come together and talk about ARGs and help each other solve them. On this website, you can find a page that offers “training” to help people complete ARGs. This page covers topics such as basic web development, ciphers, steganography and other topic that the average person might not have any experience in (see image below). This helps give us an insight as to what ARGs can include. However, it is worth noting that this community is specifically for people who like ARGs meaning that they will have more knowledge than someone who may only be participating in an ARG because it is advertising something they are already interested in. While it may seem unfair, this could be fun for people who don’t feel qualified enough to solve ARGs as they can spend a bit more time theorising and continuing to build up hype while others solve it.

A screenshot of a computer game

AI-generated content may be incorrect.

(figure 1 - game detectives academy page)

## I Love Bees

I Love Bees (or ILB for short) was an ARG created to help advertise Halo 2 in 2004, with many of the developers also working on The Beast (mentioned previously). According to an article by Arun Devidas for IGN (2004), I Love Bees started when people who had previously participated in ARGs were mailed jars of honey which contained letters that lead to the website for the ARG and a countdown. This website, styled to look like one relating to beekeeping was also briefly shown at the end of cinematic trailers for Halo 2 and despite these events happening around the same time, they were not publicly connected for a few weeks. The website appeared to have been hacked with random symbols and characters being displayed with a woman claiming to be the website’s owner creating a web log.

A bee on a plant

AI-generated content may be incorrect.

(figure 2 - image of corrupt bee - (Halopedia, 2022))

The puzzles in this ARG were incredibly vague and no guidance was given to any of the players. One puzzle involved a bunch of GPS coordinates and time codes, but no further information was given, but players eventually figured out that the coordinates related to pay phones with the time codes referring to when these phones would ring. Some phone calls had pre-recorded messages while others were made by a real person, allowing players to interact with the characters in the ARG. This did unfortunately cause someone to risk their life: one person stayed by a phone in Florida to reveal what was being said, despite Hurricane Francis being really close by but this was obviously not something that the creators probably intended to happen. Back on the website, some players examined the corrupted data for clues, using the raw image files and encrypted files. Eventually, some players were contacted by telephone, email, and even travelled to meet up with each other and characters from the game, and were rewarded with parts of an audio drama that explained how the website ended up in the state that it was in the beginning of the ARG. The ARG came to a close by inviting certain players to certain cinemas where they were allowed to play Halo 2 before its initial release date and receive a free commemorative DVD.

## Frog Fractions 2

Frog Fractions 2 was the sequel to Frog Fractions which was styled as a game to teach young children about fractions, but nothing is actually taught. While the first game isn’t an ARG the second game is. The success of the first game caused a Kickstarter campaign to fund the creation of a sequel and a video was released along with the campaign which, at first glance, seemed to be a genuine pitch for the game but was interrupted with some cryptic messages.

According to Game Detectives (2018), when opening the source code of the developers’ website some code can be found and removed, the user can find the link to a video. If the player takes the audio from the video and runs it through some complicated audio decrypting software which gets revealed to be code for a Game Boy Advanced ROM which when run in an emulator produces a version of Rick Astley’s “Never Gonna Give You Up” (a common internet joke known as the Rick-roll).

Another web page on the developers’ site includes instructions about making bread. These instructions can be put into the text-based adventure section of the first Frog Fractions game which will result in the player being given a URL which then takes them to another game called Obama Shaving Simulator. After the player successfully gives Obama a clean shave, a message is shown telling the user to go to a specific location at a specific time – bringing the ARG into the real world. At this event, a series of events happened that were references to the original Kickstarter video. Someone at this event drops a bag of floppy disks which contain images of bug porn from the first Frog Fractions game. These images had data which could be translated to give a message, but some images were locked behind a password. When using a string of numbers found in the Kickstarter video, an MP4 file is revealed containing a walkthrough of the original Frog Fractions game.

As this ARG is so long, a summary of the puzzles that happen from that point forward include running images through steganography software, translating morse code, playing a user-created level of Super Mario Maker, several twitter accounts from characters established in the Kickstarter video, as well as people receiving physical boxes that contained writing that could only be seen under UV light. The ARG concluded with another game called Glittermitten Grove being updated to include Frog Fractions 2.

## Twenty One Pilots and Dema

Not all ARGs can be used just for entertainment with some being used as promotional materials for a show, movie or an album – an example of this is the band Twenty One Pilots who made an ARG to promote and build up hype for their 5th, 6th and 7th studio albums as well as using this ARG to give more details on the story that they are trying to tell with their music.

The ARG started on the 21st of April 2018 when, according to the Fandom Wiki page, a reddit user found a GIF on the store page for their album Vessel which showed a URL, dmaorg.info which when entered, would take the user to a website that would display an error code and a message to the user saying that “they” can’t find out about this page with a violation code. When going back to the store page, there would be another GIF that had an extended but incomplete version of the original URL. Users figured out that the violation code on the original site is what was missing (making the full URL: dmaorg.info/found/15398642\_14/clancy.html) and this took them to a website filled with letters from a character called Clancy who is trying to escape a city called Dema run by 9 bishops – all of this is a representation of the lead singer’s psyche and his struggles with mental health. These letters were filled with references to songs that would later be released on the band’s upcoming album Trench. This website would later be updated with more letters to build up hype for future albums which revealed more of Clancy’s story.

### Level Of Concern

In June 2020, the band started another ARG which was purely something to entertain fans during the COVID-19 pandemic. This ARG started on the 12th of June when a livestream was uploaded to the band’s YouTube page which showed a TV that would have images briefly flash on screen (see image below).

A screen shot of a television

AI-generated content may be incorrect.

(figure 3 - still image of the livestream)

One of those was a code that could be translated into a phone number which, when called, explains that there are several codes and clues hidden around the internet for people to find. There was a link in the description of this livestream which took users to a site that would ask for a code – this is where the heart of the ARG was. Each code entered would allow the user to download a folder that contained images which contained hidden clues as to what the next code will be. After the 20th code, a website was revealed which allowed users to upload videos of themselves dancing to the band’s newest single *Level Of Concern* which would then be used in a future project. The first 500 people who entered the 20th code received a USB which contained old demos the band had made.

As previously mentioned, each code entered allowed the player to download a zip file which contained clues to the next file. Some codes were found in the main livestream, some were hiding within the files that had been downloaded and some still haven’t been discovered – people found the clue but no knowledge on how was shared. Some notable puzzles include code 7 which, according to a google document created by a small group of fans (‘LOC Scavenger Hunt Document’, 2020) included a word search of the band’s songs and all the remaining letters & numbers that weren’t included in any of the words formed the 7th code. The 8th and 9th codes included a string of text which had to be decoded by moving the letters around using a specific key that was given/hinted to in the images themselves. The 10th code was found in an audio file which played morse. The 13th code included a URL which when entered, a fake “terminal” that asks the user to enter a bunch of keywords that are hidden in the various images that came with that zip file. The final code involved the user looking at the html code of the website to find a CSS file which was an encrypted string which gets revealed to be braille which translates to a message telling the user that they have essentially won.

## UFO 50

One of the most recent ARGs to surface comes in the form of a game called UFO 50 and has been described as a perma-arg. On the surface, the game is a collection of 50 8-bit styled games that are all separate from each other – save for the fact that they were all developed by a fictional publisher UFO Soft for an old console (Christian Dolan, 2024). As the player plays through the games, they slowly learn about the history of the publishers.

The heart of the ARG lies in the game’s “terminal” (see figure 1) which allows the user to enter commands such as help, list & info to perform various actions as well as enter codes to load up one of the 50 games that can be played.

A screenshot of a video game

Description automatically generated

(figure 4 - screenshot of the game’s terminal taken directly from the software)

The ARG starts when using the INFO command on one of the games where the user is told that it is the “first game directed by longtime designer Greg-milk.” The clue of “first game” indicates that this is where you begin looking for hidden secrets and the name Greg-Milk fits perfectly into the character spaces of the terminal. Doing this will reveal a 10x5 grid of 0s with a single 1 which represents one of the games. If you explore this game, you will find a symbol that can also be found in the terminal and when opening it, a hidden clue relating to another game. The player must then go to the game hinted at, perform a specific action and then open the terminal to find the next clue to continue. For example, the first clue reads “FIFTY GAMES FOR YOU TO SEARCH THROUGH, WHAT A HUNT I HAVE FOR YOU! I OFFER UP THIS STARTING CLUE: TURN YOUR SKIN A SHADE OF BLUE” which references one of the games called camouflage where the player must turn the chameleon they play as blue – opening the terminal will reveal another clue to the next game. Eventually, the player can piece together a code to play a hidden 51st game which tells more story about the development company.

One of the main things that makes this game stand out from other AGRs is that it never leaves the confines of the software – in the sense that the player never needs to go to another website or an old Instagram account or grab a physical book. In one perspective this could be seen as a good thing as venturing outside of the main software could be seen as daunting to some players and they may not bother; however, this does mean that some people may not count it as an ARG

# Comparing Research Data

One thing that all these ARGs have in common is hidden codes. These codes can range from numbers being translated to messages to morse code. They all also seem to tell a story of sorts: UFO 50 tells the story of a game company going bust, I Love Bees saw someone ask for help after their website got hacked, Frog Fractions involves time travel and Twenty One Pilots tells the story of someone battling with their mental health. Another thing that they all seem to have in common is that while most of them branch away from an initial starting point, they all return to it. The Level Of Concern ARG always returned to the band’s main website, Frog Fractions 2 always seemed to have puzzles being discovered in the first game, ILB was centred around a website and UFO 50 was entirely self-contained.

Between the two ARGs that are used as an actual game (UFO 50 and Frog Fractions 2), their art style seemed to be very similar in that they were both pixelated – giving them a retro feel. A fair assumption can be made that one of the main elements of an ARG is that any games will be much more popular if they look old – this assumption can be supported by the fact that Frog Fractions 2 involves using a Game Boy Advance emulator and UFO 50 takes place on an old console that uses cartridges to house each game. Adding on to this retro feel, all the games seem to include some puzzles that make the user feel as if they’re hacking or involve some low-level data/code: Frog Fractions 2 requiring you to compile code, Level Of Concern having quite a lot of steganography, UFO 50 having the terminal for the fake game console and I Love Bees had players decrypting data.

Both I Love Bees and Frog Fractions seemed to be the most complex out of the 4 analysed due to the fact that they required players to go outside to real life locations. This can cause issues with some people being unable to either due to the fact that they are simply disabled in some shape or form or live too far away to travel to wherever the ARG required them to go to, making them a little less inaccessible. As well as this, it could cause people to do some dangerous things, like that person in Florida who almost got caught in Hurricane Francis just to take part in the ARG.

Using this information, an initial proposal of some core tenants of an ARG can be proposed. These core principles are:

* Must take the player to an external source
* Must include some form of “hacking”
* Puzzles must further progress the narrative
* Must not make use of real life locations that the player has to visit
* Must have the player interpret a programming language

Expanding on some of these proposed principles, the 3rd point may be the most difficult tenant to follow as it relies on an engaging narrative, something that is important with any form of storytelling. It is also worth noting that even though the 2nd and 5th point sound similar, they mean different things: the 2nd point talks about hacking which is intended to refer to doing things such as inspecting html to look for hidden clues, while interpreting a programming language is intended to refer to actively compiling a block of code, as an example.

It is also worth noting that hacking is in quotation marks as it is not meant to be taken literally and should be interpreted to mean some form of computer-literate activity that will make the most sense to people who have some form of background with computers such as understanding binary/hexadecimal numbers, looking through html, opening images as text files etc.

With a proposal for some core tenants of making a good ARG, it is time to put these rules to the test to see if they are correct.

# Creating an ARG

To test to see of the elements highlighted earlier are things that make a good ARG, an ARG is going to be made using those elements and more which will be given to people of varying computer literary levels to see what they like and dislike about it.

We will test the idea of taking the player to an external source by having the player go to a website that is made specifically for this ARG and further progresses the narrative.

To test to see if “hacking” is something that should be included in an ARG, one puzzle will have the option to be solved by inspecting website’s html and another puzzle will involve opening a fake command prompt (from within a downloadable game) where the player must enter commands to change levels.

To see if having the player interpret a programming language is definitely something that should be included in ARGs, one puzzle will have them compiling a small C++ program.

To ensure that the game is accessible to anyone, it is worth noting that the ARG that will be created will never require the player to leave their house and venture off into the real world - asking play-testers about this decision in the feedback form will also help us prove that ARGs should not force players to travel places

## The concept

The ARG that will be created will start of as a top-down 2D game where the player must move through several levels that are presented as an un-finished demo game from the mid-1990s. After the third level. They will be asked to follow a link to purchase the full game (it is worth noting here that the player will never need to purchase anything to complete this ARG). Going to this URL will show the player a fake Page Not Found screen which gives them the option to enter a code to access the full website – which can be found hidden in the second level of the game. Navigating this website will allow them to download a pdf of a hand-written cheat sheet that tells the player that they can access a command prompt within the game and enter commands that allow them to change levels quickly, as well as access two hidden levels that can’t otherwise be found. Within the html of the website, on a second faux error page, they can also find hidden a C++ program that will display some morse code which explains how to get to the true ending of the game.

In order for there to be sense to the puzzles and not have the user feel like they are on a wild goose chase, the game will have to have a story. Due to the top-down 2D game being styled as a demo that is un-finished and was not received well, there will be little story actually taking place within the main game; most of the narrative will be revealed in the downloadable pdf of the game’s user manual which gives a backstory on some characters that don’t actually exist and have been made up to make the narrative feel more alive but ultimately is irrelevant in order to finish the ARG. The narrative of the top-down 2D game will follow a character called Ellie who is exploring castle grounds trying to bring her cat, Molly, back to life (which is where the game’s name comes from: Myth Of Molly).

The idea for the user to be greeted with a fake “page not found” screen when they first go to the website is taking inspiration from the Twenty One Pilots Dema ARG where the dmaorg.info site is a fake error screen. The idea of having the game largely take place in a downloadable game takes inspiration from Frog Fractions and the idea of entering commands into a pseudo command prompt and the idea to download an old game manual with hand written notes takes inspiration from UFO 50 which has the terminal where players enter codes and the fact that that gam is a love letter to older video games – which almost always came with manuals that shared extra information on the game as well has having a notes section at the back of them. Other inspiration (such as the colour scheme) comes from the tutorial section of the game Undertale which is themed around the colour purple.

## Tools

The main game will be made using Godot 4 as it seems best suited to make a 2D game with, compared to other engines such as Unity which takes a lot of processing power and Unreal Engine which, while it can make 2D games, it is best suited for 3D games (as well as also taking a lot of processing power to run, like Unity). Unity have also recently changed their pricing model which will charge publishers a certain amount for every install after a certain threshold (The Verge, 2023). Even though there won’t be enough people installing this game for this to be an issue, Godot still feels like the best option.

Artwork for the game will be sourced from Itch.io and sound effects will be sourced from freesound.org. All assets sourced will be free and creators will be given credit in a menu within the game.

The website will be developed using simple html and will be hosted using GitHub as they have a free web hosting service as long as the URL contains “github.io” which will not be an issue. Using GitHub as the web host is also useful as the 2D game is also being stored on GitHub to help with version control if anything goes wrong whilst it is being developed.

The game will be downloadable from itch.io as it allows players to download the game for free as well as restricts who can download the game making it easier to control who play tests the game; this won’t actually be necessary but is an option in case internet trolls find it and give false feedback (although this is still highly unlikely). This itch.io page will also explain to players what the game is for, what they need to think about while play-testing the game.

## Design documentation

### Story board

The storyboard of the ARG was the first thing to be designed in a notebook (see image below) which would detail each step to solve the ARG. This initial design would have included an ability to scan the environment for clues and picked up items which would be lost if the player tried to jump levels using commands. This initial storyboard would also have buzzles relating to encryption. These features ended up being removed as they felt like they were being shoe-horned into the game, and it would’ve been difficult to write a narrative around some of them – hence why the story board is unfinished. Once a narrative had been created, a more final story board was created around it which is more like what has been created (see appendix 1 for final story board).

A notebook with writing on it

AI-generated content may be incorrect.

(figure 5 – original storyboard for Myth Of Molly)

### Game & website design

To help make the development process easier, rough sketches of key levels & web pages have been made using MS Paint. The first level of the game will be simple as the player just has to walk to a door to complete it, meaning it would be a waste of time to create a rough sketch of how that level should look when the content of the level is relatively unimportant and can be decorated as it is made. Similarly, the third level will take the form of a maze which can also be designed as it is made, and the pseudo command prompt will also have a very basic design of a text box for the player to enter commands into followed by another next box that outputs errors meaning that a rough sketch for this page will also be fairly unnecessary. Anything that is coloured red has been done so to highlight the importance that it plays in solving the ARG.

The second level (see image below), taking the form of a grave yard, will need to be designed before it is made as it includes the password to the website in binary form – this is highlighted by the red squares which are supposed to represent graves; the tall graves will represent a 1 with the shorter graves representing a 0 to give a binary figure which can then be converted into a base 10 number to give the code (the bottom row will need to be appended to the row above to reveal the full code.) The green in this level represents grass, the grey sections represent pathways, the brown line in the bottom right is the door to the next level and the purple square represents where the player character will be located when the level loads.

A green and red striped background

AI-generated content may be incorrect.

(figure 6 - original design of 2nd level with binary puzzle)

The website will also need design documents as this will help bring the narrative to life. The main page of the website that the player will need to visit is the Forums page (see image below). The website has a very simple design using very basic CSS to help sell the idea that the game is poorly made – as well as a comment from a user expressing how much they dislike the game due to how bad it looks. At the bottom of this page, there will be a comment from a user who is sharing a game manual that has hand-written cheat codes in it. As this manual will largely consist of hand-drawn scribbles, a rough sketch would feel like a waste of time.

A screenshot of a computer

AI-generated content may be incorrect.

(figure 7 - Forums page of website)

The first secret level (see below) will mainly be used to hide a hidden key. The area of this key will be hidden behind a wall so the player character will technically disappear when they try to access it. Surrounding the edge of the level will be flowers (represented by yellow and white circles) which will change colour next to the opening of the hidden area to help aid the player to where they need to go. This sketch also follows the same rule of green grass, grey path, purple player character and red to represent important feature to help the ARG progress (other rough sketches can be found in Appendix 2, 3, 4 & 5).

A green and yellow rectangular object with a letter l

AI-generated content may be incorrect.

(figure 8 - Secret Level 1)

## Bugs found

The final look of the 2D top-down game and the website is fairly similar to how they were designed without much being changed (see appendix 5 for final screenshots). Once a build of the game had been made, some bugs had been found. The first bug appeared when trying to open the door in the final level after picking up the key, but nothing would happen; a Boolean variable that dictates if the player has picked up a key or not was always being reset to false whenever the final level was loaded. This was due to the variable not being global and being constantly re-declared as false in the player code whenever the player loaded a scene and was fixed by moving it to a global script – a feature of Godot. Thankfully, this was found before the game was given to people so it could be fixed immediately.

When the game was released to the testers, one person reported a bug which caused the game to crash completely when trying to walk through a door. However, when asked to replicate it (and provide evidence of it happening) they were unable to so there was nothing that could be done. Out of pure coincidence, one tester happened to have their play through observed, and they happened to run into the same bug. Due to this coincidence, it was discovered that if the game was played in a maximised window and closed the game in the middle of a level, then the game will crash whenever the player re-opens the game and tries to walk through a door. This bug was quickly avoided by this specific player by re-installing the game and playing at the default window size. Due to the fact that it was never brought up by anyone else – and how late it was discovered with time constraints – the bug had to be left in the game.

# Gathering feedback

With the game now complete, a selection of at least 10 people have been collected and have agreed to play-test the game and fill out a feedback form detailing their opinions on puzzles throughout the game. This questionnaire will ask what they thought about the puzzles in this ARG, how difficult they found it and overall enjoyment. Players will also be asked about their experience with computers to put a perspective on how difficult they thought the puzzles were – for example, if 80% of players thought the binary puzzle was too difficult but all of them had little to no experience with computers and the 20% who found it easy already understood binary numbers, it will offer a different perspective of results rather than coming to a blanket conclusion of “80% of people don’t know binary numbers”. This decision was made due to the Game Detectives website that was found during the research stage.

## Questionnaire results

After giving people almost an entire month to play-test the game, only 8 people have been able to send in their feedback – normally two more participants would have been gathered but due to time constraints, this cannot be done meaning that the results may not represent the general public’s overall opinion. When asked to rate something, they were given a scale of 1 to 10 with 1 being very poor and 10 being excellent. (Full raw results of the questionnaire can be found in Appendix 7)

The first question asked the participant to rate their computer experience. This felt like an important question to ask as it may shed some light on what puzzles people with a higher understanding of computing found easier. The average computer experience of the 8 participants was 8 meaning that they have quite a high understanding of computers. This will help us draw correlations between other results and general opinions.

The first question about the game and puzzles asked how the code to the website was found. The results (see image below) show that the majority of people opened up the html of the website. While this may not have been the intended solution to the puzzle, it is still interesting to know as it shows that most people would rather try and “hack” their way through puzzles.

A screenshot of a computer

AI-generated content may be incorrect.

(figure 9 - results of second question)

The third question asked participants for their opinion on the binary puzzle which had an average rating of 3.25 indicating that many people did not like it. One user said that it felt like the only real puzzle in the game (stating that the game itself felt more of an afterthought) with two more people saying that they got stuck and one participant requesting a hint. When looking for a correlation between user opinions and each user’s computer experience, there seems to be a negative correlation meaning that people with more computer experience didn’t enjoy it as much as those with less experience. One participant stated that they felt they cheated by finding the password in the html as it they felt it wasn’t the “’correct’ way to do it; it’s still a cool way don’t get me wrong but it felt like cheating”. The same person also felt like the clue was worded poorly as they had an issue with the definition of the word append and that the clue was “using language that the average user may not know, I still don't believe append was used correctly in this context programming or not”. Another participant appended the binary numbers together and *then* converted them to base 10 which didn’t produce the correct passcode, and they eventually gave up (implied by the fact they stated they were curious as to what they did wrong).

(figure 10 - Scatter graph showing correlation between computer experience and enjoyment of binary puzzle)

The fourth question asked for opinions about the user manual and hand-written note which had an average score of 5.875. This implies that participants felt fairly neutral on this section, however reading answers to the extra thoughts section, one person stated that “The second notes page in the user manual sort of brought my rating of that part down, just because I feel it was more fun to see "room 4" in the forum, link it to the secret levels and then apply the morse in the error page to that problem rather than just essentially being told the rough answer”. This gives the impression that the user manual revealed too much about the game, and it would’ve been more fun if people weren’t told where to go. Like the previous question, there is a negative correlation between user opinion on this puzzle and computer experience (see appendix 7 for scatter graph with trend line).

Question 5 asked for opinions on the pseudo command prompt which had an average score of 6.875 – with this being the highest average score of the three parts of the ARG. No one gave any extra opinions on this section so there isn’t much to talk about other than the correlation between opinions and computer experience – which was also a negative correlation (see appendix 8 for scatter graph with trend line).

The sixth question asked participants if they thought the ARG would’ve been better if there was a social media page involved with one of the puzzles and half of the participants thought that it would, but not massively with a quarter of the participants thinking it wouldn’t have made a difference and another quarter being unsure. This could be down to if it would make sense in the narrative of the game but since no extra feedback was given on this part, no proper conclusions can be drawn. The participant who had their play through observed by complete coincidence said that they thought the forums page of the website counted as a social media site but it was clarified that it didn’t count as it isn’t real and the questionnaire was talking about real social media sites that are currently in use, such as TikTok, Instagram, X (formerly Twitter) etc.

A white background with black text

AI-generated content may be incorrect.

(figure 11 - results of question 6)

Question 7 and 8 asked about if people would be willing to go outside if an ARG required it and how far people would travel. Most people said that it would have to depend on how invested they are in the ARG or how far that they would have to travel (see image below).

A screenshot of a graph

AI-generated content may be incorrect.

(figure 12 - results of question 7)

When asked about how far they would travel, the results varied, with some saying they would only travel about 2km (or 1 mile/20 minute walk), one person said that they wouldn’t leave their campus, two people said they wouldn’t leave their country (with one person specifying they’re from the UK and would only leave if there was a monetary reward) and one person saying that if needed to, they would “need to be incredibly invested to bother” (see appendix 6.8 for full breakdown).

The ninth and tenth questions asked users how many hints they had to ask for as well as what hints were given and unsurprisingly, the participants with more computer experience required less hints (and the participant who rated their computer experience the lowest score received the most hints). The average number of hints given was 0.75 – most people didn’t ask for any hints and the person who asked for the most hints only asked for three hints. One person stated that they don’t know if they can consider the help they received as hints as it was more just clarifying what they “thought was correct was indeed correct” but they then went onto say that being told to append the two binary numbers as if they were a string was helpful as they were “100% gonna add” them together as if they were numbers. Another hint was given to another participant on the same puzzle as they thought the binary numbers had to be converted into ascii instead of denary numbers.

Question 11 asked for an overall rating of the ARG with question 12 being a change for participants to share any extra thoughts they had. Overall, the ARG had an average rating of 5.625 with 50% of participants giving a score of 7. When looking at the extra feedback given, one participant said that they enjoyed the forum side of the ARG as “It did feel like uncovering something old and forgotten and that had a cool feel to it” however they then go on to say that the game felt poor and suggested it be called an early alpha build rather than a demo and wished for more backstory on why the game never got finished to begin with. Another issue that this person raised was that they felt the hints to the location of the cat key were too convoluted and it would’ve been better if they found the key by exploring. Similarly, another person said that they felt being told about the secret levels in the manual was a bit unnecessary as it had already been hinted at in the forums page of the website

Another person said that they enjoyed the ARG as they’ve “always liked games with these sorts of elements, particularly when they're a bit challenging but not so much that I get frustrated at my inability to figure things out on my own”.

The fourth person to share extra feedback stated that they liked the idea of being sent to an external source and the hand-written manual was a great idea with the vague footsteps as to where to go next. They also said that the binary puzzle was “a tad hard for most non computing people” and said that a bit of handholding might be useful.

## Comparing data to initial research and guideline proposal

When comparing the questionnaire data to the initial research and guideline proposal, the first thing that becomes apparent is that most people seem to unanimously agree that in order for a game to be considered an alternate reality game, the story has to take place across multiple different platforms and take the player to external sources. This can be seen by how people don’t really class UFO 50 as an ARG (since the story only takes place in the one location on a device) and the player feedback of the ARG that was made for this project.

Building on this point further, having an ARG take place on a social media page seems like something that could be added to the guidelines since most of the ARGs analysed at the beginning of this project had social media pages involved and 50% of participants in the survey said that they think the ARG made would have been better if there was some form of social media page.

The second thing that becomes apparent is that people seemed to instinctively open up the html of the website to “hack” the website. This supports the second proposed guideline which stated that there must be some form of “hacking” in the ARG. Despite this, one person did feel like it was cheating so it might be worth elaborating on this point a bit more to state that if there is a genuine solution, make sure players can’t cheat their way through it.

Alternatively, the most popular puzzle in the ARG created for this project was the pseudo command prompt where players could enter commands to access levels that they couldn’t get to by any other means which further supports the rule of having some form of hacking segment in an ARG.

The questionnaire results also supported the idea of making sure that players don’t have to leave their house and go to a real life location to solve a puzzle. While the ARG created for this project was being created, another ARG was started by the band Car Seat Headrest to promote the lead single to their new album where one of the puzzles required fans to travel to Champion Shrine in Wisconsin, USA; however, by complete coincidence, there were no fans who lived in the area that were able to travel there which left a lot of fans annoyed – especially since what they were looking for could not be seen from Google Maps or Street View (see image below for discussion).

A screenshot of a computer

AI-generated content may be incorrect.

(figure 13 - Discussion on the band’s subreddit talking about how the clue can only be found in person)

When trying to find evidence to support or argue against the final proposed rule, not many people gave their opinions on the C++ puzzle apart from how it felt too convoluted and a bit of a waste of time – which doesn’t really give much information of if this specific guideline is correct or not. Looking at the initial research data, only one of the 4 ARGs had sections that required you to interpret some form of programming language which suggests that maybe this rule isn’t completely necessary to make a good ARG. While some people may debate if html is a programming language, officially, it is not classified as one meaning inspecting the html of a website does not count as interpreting a programming language.

One thing that is different between the ARGs analysed and the one that was created for this project was that the participants of this study didn’t work together, and all completed it independently. While the ARG that was made as not complex enough that people would need to work together, all the initial research data showed that players almost always talked about and discussed solutions to puzzles – even if some of these communities existed already, people began to talk and potentially form friendships and allowed people to potentially learn new skills so it may be worth adding this into the finalised guidelines.

## Refining the guidelines

Overall, the guidelines proposed at the beginning of this project were correct for the most part but can definitely be refined and perfected based on the new information gathered. To start with, the idea of making sure a good ARG doesn’t make use of real life locations can be re-worded to state that the player must be able to use google maps to find the clue.

Another guideline that can be re-worded is the need to have puzzles make sense to the narrative. While it is important that puzzles make sense, this point can be re-worded to say that puzzles must progress the narrative and that there should not be any puzzles that can be considered optional or can be missed/ignored as this may make the ARG more convoluted than it needs to be, which was something that

One guideline that can be removed is the idea of needing to have the player interpret some form of programming language as only one ARG from the initial research did this and the survey results showed that people didn’t care for that specific puzzle much – to the extent of no one really talked about it.

A new guideline that can be introduced however, is to make sure that the ARG brings players together and forms a small community. With how much of the background research showed that ARGs can bring people together, it can be argued that it is important to make sure players come together, especially more inexperienced players who can then learn from the more experienced players. This can be done by including a social media page (which can be its own guideline) where players can look at who else is interacting with posts and form group chats with each other to solve puzzles. As well as this, if being used as a team building exercise, it is definitely important for an ARG to get players talking to each other.

With this new information, a new set of guidelines can be proposed which have been refined and altered. These are:

* Must take the player to a social media page and/or another external source
* Must make the player feel as if they are “hacking”
* Must make sure that any real life locations can be accessed via online maps and street view
* Must bring players together to form a community and get them talking with each other
* Must not include puzzles that are “optional” or can be ignored
* Must not have puzzles that can’t be accessed using the internet
* Must not have a second solution to a puzzle that can be seen as “cheating”
* Must not be next to impossible to complete

Similar to the initial guideline proposal, hacking is again in quotation marks as it is not meant to be taken literally and should be interpreted to mean some form of computer-literate activity that will make the most sense to people who have some form of background with computers such as understanding binary/hexadecimal numbers, looking through html, opening images as text files etc.

Making sure that real life locations can be accessed via online mas and street view helps ensure that the ARG is accessible to everyone who is participating and doesn’t exclude anyone who may not be able to attend for various reasons.

The inclusion of puzzles that are optional or can be ignored may end up making the ARG more convoluted than it needs to be as well as potentially wasting time and resources making it and players feeling like they are being misled.

Puzzles should only have one solution as people may feel as if they are cheating their way through the game which may reduce the amount of fun they are having. Making only one solution to a puzzle allows players to keep focused and can lead to a greater sense of accomplishment rather than having them feel they have given up and opted for the “easier” route.

Making sure that players can actually win is already a core principle in game design anyway, but it is worth adding more emphasis when it comes to ARGs as the way they are play-tested is different. Traditional games (and perma-ARGs) go through rigorous playtesting before they are published but there is no easy way to test an ARG without starting it and letting people play it genuinely. If the ARG feels impossible to solve then players may begin to lose interest and stop playing which, depending on the reasons for creating an ARG, can cause various problems.

# Conclusion

Alternate reality games are a unique way of telling a story and with the number of different ways they can be used, there is surprisingly not much academic research on them – which was one of the main driving forces of this project. After looking at some examples of previous ARGs, making one and allowing people to provide feedback, a selection of guidelines has been created which will hopefully help people create their own ARGs and provide a better chance of them being successful. The proposed guidelines were fairly accurate with only minor changes being made.

As these are only guidelines, they do not necessarily need to be followed to a tee for an ARG to be good, as long as breaking these rules is done well. For example, an unwritten rule of game development is the method of teach, train, test where you introduce a concept to the player, you show them how to use this feature and then you test their ability with this feature and use of this rule, as well as this rule being broken, can be found in Minecraft. The player is taught that they can kill mobs such as cows and chickens for loot, the game then trains the player by introducing hostile mobs which can be killed so the player doesn’t die and then they are tested with stronger mobs which will drop more valuable items. This rule is then broken when the player encounters a mob called the Warden which has a lot of health and doesn’t offer any substantial rewards for killing it meaning the player has to run – completely going against everything the game has taught them. While this one example, it highlights that these guidelines should only be broken with caution.

Overall, this project was fairly successful in achieving what it set out to do as well as making sure each task was completed on time. Whilst working on this project, a Gantt chart was created that documented how long each task was taking which helped plan what tasks needed priority and what could be completed in seconds (see image below)

A screenshot of a computer

AI-generated content may be incorrect.

(figure 14 - Gantt chart of first milestone tasks)

A screenshot of a computer

AI-generated content may be incorrect.

(figure 15 - Gantt chart of second milestone tasks)

A screenshot of a computer

AI-generated content may be incorrect.

(figure 16 – Gantt chart of third milestone tasks)

One of the main restrictions that fell upon this project was time with only 5 months being available. This mainly became an issue when waiting for people to play-test the ARG created for this project as people have other, more important commitments in their lives and not everyone was able to provide feedback. This did result in a fairly small sample size – something that would have provided more accurate results. As well as this, a full exploration of ARGs was simply beyond the scope of this project. With more time, this project could have explored the optimal difficulty and complexity of ARG puzzles which could look at the abilities of regular ARG players, go further in depth into the topic of this project and also look at how ARGs can be used specifically in advertising, how they compare to more typical ways of building hype and showing general interest in a project.

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# Appendices

## Appendix 1

Final story board – blue writing takes place in the top-down game, black writing takes place on the website, red represents programming and green text represents notes that explain certain puzzles.

A notebook with writing on it

AI-generated content may be incorrect.

A piece of paper with writing on it

AI-generated content may be incorrect.

## Appendix 2

Initial page of website that first greets the player

A screenshot of a computer error

AI-generated content may be incorrect.

## Appendix 3

Home page of website – blue text represents hyperlinks

A screenshot of a computer

AI-generated content may be incorrect.

## Appendix 4

Second error page - the html of this page hides the C++ program

A white paper with red text

AI-generated content may be incorrect.

## Appendix 5

Final level of the game – the red line represents the locked door, and the brown square represents the hitbox that triggers the end of the game

A green rectangular object with a red line

AI-generated content may be incorrect.

## Appendix 6

Screenshot of final grave level with binary puzzle

A video game screen with a person in a purple garment

AI-generated content may be incorrect.

## Appendix 7

Raw result of each questionnaire question

### Appendix 7.1

A screenshot of a survey

AI-generated content may be incorrect.

### Appendix 7.2 A screenshot of a computer AI-generated content may be incorrect.

### Appendix 7.3A screenshot of a computer AI-generated content may be incorrect.

### Appendix 7.4A screenshot of a computer AI-generated content may be incorrect.

### Appendix 7.5A screenshot of a computer AI-generated content may be incorrect.

### Appendix 7.6A screenshot of a computer AI-generated content may be incorrect.

### Appendix 7.7A screenshot of a computer AI-generated content may be incorrect.

### Appendix 7.8A screenshot of a computer AI-generated content may be incorrect.

### Appendix 7.9

A screenshot of a computer

AI-generated content may be incorrect.

### Appendix 7.10

A screenshot of a computer screen

AI-generated content may be incorrect.

### Appendix 7.11

A screenshot of a computer

AI-generated content may be incorrect.

### Appendix 7.12

Note: Response 1 was too long to fit into one screenshot so it was copy and pasted into notepad where the window could be re-sized so it could all be read in a single screenshot

A black screen with white text

AI-generated content may be incorrect.

A screenshot of a computer

AI-generated content may be incorrect.

A close-up of a text

AI-generated content may be incorrect.

## Appendix 8

Scatter graph showing correlation between computer experience and enjoyment of user manual

## Appendix 9

Scatter graph showing correlation between computer experience and enjoyment of pseudo command prompt

**NOTES FOR FURURE ASH: MENTION CSH ARG – NO FANS LIVED IN CHAMPION SHRINE, ROSEMARY WALK, WISCONSIN**