Level design and semiotics: player guidance through signposting

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Abstract

This paper will examine the thought process game designers use in term of level design, how level design can assist a player's navigation in a game, whilst allowing them to engage with the environment and learn the mechanics of the title.

Key terms: *Portal, Portal 2, Mirror's Edge,* semiotics, level design, environmental symbols, signposting, player experience.

Introduction

This research is aiming to explore the different ways a game designer can uses signposting when creating levels, the objectives of this research is to look into how would you get the player to go where the game designer intended or the objected ,without making the player feel like the game designer is holding their hand though the levels, as games design are always trying to create fun engaging experiences for the player using symbols, signposting in video games have been use in video games since the early days as it is useful way of not getting the player lost within your level.

In this research it will be considering semiotics, how we define them in media and video games, what are the four different concepts in semiotics, what are signifiers and signified, how we understand semiotics as a language of sign that contains meaning.

> "**Ferdinand de Saussure** (1857-1913) French linguist who pioneered the semiotics study of sign, organised in 'codes' and 'structures'. The Russian theorist Volosionv, however, suggested the term 'decoding' tents to treat language as a dead thing, thing rather than a living and changing activity." (Branston & Stafford, 2010, p. 11)

The research will be considering level design, looking at the theories of level design, what makes a good level design and how you can use symbols to make better levels. It going to be

explore the methods of Chris Totton and Emilia Schatz, with Totton mention when creating environment symbols there is two symbols the game designer would need to follow in games, Emilia Schatz explains on how to make environment playable and understandable to the player. A level design can be linear or open world that using symbols guild them throughout the level, with linear is game space that players can only move forwards and back on a line.

> "Linear. A surprising number of games are arranged on a linear game space where a player can only move forward and (maybe) back along a line. Sometimes the line has two ends, other times it loops back on itself (2008, Schell p.331). "

With study of signs are uses in video games this will look at the theories of signs in semiotics and how a game designer should use the signs to guide the player in level.

Literature Review

A variety of theories exist surrounding game designer and level design. In the context of the artefact of this assignment, the research has been arranged to focus on semiotics and level design. This material will also allow a link to be made between the theory and the case studies, identifying the use of signs and player guidance in popular titles.

Semiotics

Semiotics was originally known under the term semiology, it is a language system of signs that contains meaning. Semiotics is a study of how meaning is made. When we look at semiotics it way of giving an object a meaning so when we designate object or ideas that we can understand the sign by taking what it represents. A sign is represented something other than itself, so we

take the representation as the meaning of the sign. When we see a person running in green sign represents the concept of fire exit or another example is triangle traffic light sign represents the concept of traffic light ahead, because of our capacity to understand that a sign represent is at the heart of semiotic study.

With semiotics as a study of signs in the media they use it as a code or structure but many seem to find them as suggested it as a term of decoding tents that is treat language as a dead thing, rather than a living and changing activity.

> "**Ferdinand de Saussure** (1857-1913) French linguist who pioneered the semiotics study of sign, organised in 'codes' and 'structures'. The Russian theorist Volosionv, however, suggested the term 'decoding' tents to treat language as a dead thing, rather than a living and changing activity." (Branston & Stafford, 2010, p. 11)

Semiotics can have two different way of seeing a sign: *signifier* and *signified*. The signifier is a sign that is physical whereas signified is a sign that refers to something other than itself and it is important to grasp that it is a concept, not the thing in the world (Branston & Stafford,

2010, p. 13). There are four different concepts that semiotic can be recognizes by the four key areas that constitute the constitute the concept of a sign:

- **A sign represents something other than itself** – In the Crash Bandicoot each crate represents something different to the player.
- **Signs are interpreted** – is something to somebody. consider player as active interpreters of a game sign system. Take tag for example one day the home base is a tree and then another day the player decided to change the home base sign to rock.
- **Meaning results when a sign is interpreted** - when meaning results when a sign is interpreted, like in a game of rock, paper and scissors hold vales but if the player was trying to do the scissors but the player hold up three fingers instead of two they failed to create a sign within the system of the game therefore it creates new sign as representative of scissors but it is down to the other to accept or reject the new sign.
- **Context shapes interpretation** – Context is a key component to our general definition of design it also is a key component in the creation of meaning.

When you encounter at semiotics sign it can bring meaning to someone to somebody as in a level you can places a sign in the game world and the player can understand it by what the sign representing. Semiotics can be uses as a term sign to describe the way that meaning are socially produced.

Level Design

In videos games a game designer need to create a level for the players to experience, in the level the player should never get lost within the game world, if the player gets lost that created bad experience and bad level design, in level they have symbols throughout the levels that the player learns what they mean though playthrough. Totton (2014, p. 6) explains how level design allows the player utilize space by creating environment scene in games, level spaces in

games are for an engaging experience for player, when you are creating levels, you would need to consider what you think what kind of game it going to be because if you were going to do first person shoot it would have different need for a platform puzzle game. Single player level design would be different to a multiplayer level because in multiplayer you would need to balance the teams to make it more fun whereas in single player is all about the experiences of the journey.

In level design, what game designers used to communication with player are three goals that gives meaningful user experiences. (Totton, 2014, p. 42)

- Adjustment of behaviour
- Transmission of meaning
- Augmentation of space

Totton (2014, pp. 172-175) outlines level desgin and its way of using symbols to leading the player to where the game desginger trying to take them, by using symbols it is a good way of introducing mechanices early. With symbols it a good way of guiding the player though the level and teaching them how to your core mechanics early in the game. When doing environment symbols there is two rules a game desginer should follow in games:

"1. Each symbol must have a unique appearance, even from similar environment art objects.

2. Each symbol must be repeated so the player learns what it means through repetition." (Totton, 2014, p. 172)

When game designer following these two rules it will allow them to use prefabricated game object as elements of the game's visual language. When the player is exposed to your language they will learn how to play just by knowing how to read as they play.

Emilia Schatz (2017) is level designer for Naughty Dog she explains her methods on how make your environment playable and understandable to the player, Schatz uses leverage primitive shapes to describe what shapes the level designer should be thinking about when creating environment scene. The three shapes Schatz believe using the basic shape circles, squares and triangle to define what is useful to the player, what not useful and areas the player should not worry about. Schatz goes on to explain that the **Round** shapes means safety and do not worry about. **Rectangular** shape means it might be useful towards the player. **Diagonal** pointy shape means sense of danger and imbalance

Schatz's (2017) method for defining environment. Uncharted 4 (2016)

These two pictures demonstrate Schatz's method in *Uncharted 4* (2016) where the round shapes like floor grass and water plane do not need to be worried about, the rectangular shape like old buildings may be useful towards the player, diagonal shape the trees are not useful.

Semiotics is a sign of study and level design is how the player utilize space, the artefact designed for this assignment follows the method of Totton and Schatz (2014; 2017). As we explore the artefact design and how their method being applied.

Methodology

The following section explains the types of resources and methods/justification for obtaining information in some of the video games to be uses as case studies, they were selected on how they use signposting, an artefact was created to test the theory and the case studies.

Case Studies

A case studies is a research strategic that uses too focus on just one instance of the things that is to be investigated. The reason case studies useful is because it helps the researcher get more in depth and provide an explanation in the areas that they want to investigate. With case studies it has been used for a wide range of purposes within the social research (Denscombe, 2010, p. 55). By using the case studies, you be able to discovery information on what other people have been saying about the topic.

Portal & Portal 2

Portal (2007) *and Portal 2* (2011) is a puzzle game where the player will have a set of puzzles to be solve with a cube and portal gun. *Portal* in terms of level design is how it uses environment symbols throughout its levels to guide the player where the developer wanted them to go without holding the player's hand, by using environment symbols it a great way to

indicate gameplay mechanics early on so that the player can learn the sign and take its represent and its meaning

The reason *Portal* and *Portal 2* are useful case studies is because the way portal uses environment symbols that gives signs a meaning towards the player throughout the level design as the player will be able to take its representation of the sign and its meaning. The level design in *Portal* and *Portal 2* has well structure with the symbols being places within the level that the player understand what they represent.

Mirror's Edge

Mirror's Edge (2008) is action-adventure game where the player is doing free-running on roof top. *Mirror's Edge* has a good linear level design where it all about the journey rather than what good for the player, with *Mirror's Edge* the way it uses red colour sign to intricate to the player what is interactable and tell the player where they should be going.

The reason *Mirror's Edge* is useful case studies is because of its level design and how it is using red colours sign to in intricate to the player what is useful within the world, with *Mirror's Edge* has a linear path for the player to go but uses red colour sign for every interactable object as the player learn what they can uses.

Manifold Garden

Manifold Garden (2018) is according to the website (www.manifoldgarden.com) "a first-person exploration puzzles game that the player is solving physics-defying puzzle in a Rediscover gravity and explore an Escher-esque world of impossible architecture." The reason *Manifold Garden* is useful case studies is because of its level design and how it tackles impossible geometry by using signposting.

With those selected case studies, they were also chosen because how their mechanics had to be through signposting. Because of that the set of mechanics were constructed as an artefact to test theories in signposting.

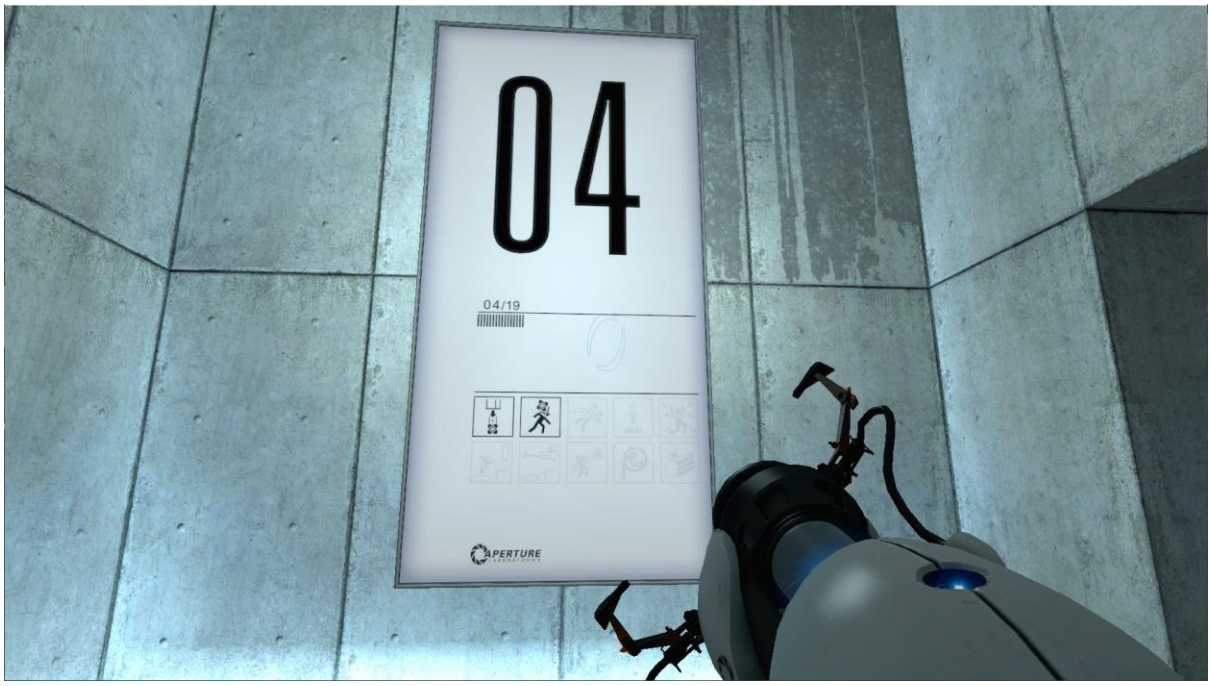
An artefact was produced to accompany the research theory, it was created in a game engine called Unreal Engine 4, The artefact is a third person character rock climbing system, the player will be able to pick up a cube and manipulate it with heat. A third person character is where the viewport of the camera is placed somewhere outside of the player character's body. The artefact was created to tests the theory coved in the literature review, namely semiotics and level design in an interactive space.

With the case studies are being used as a point of the analysis with the theories in the literature survey. The first case study to be analysed is *Portal* and *Portal 2*.

Discussion

Portal* and *Portal 2

Portal is a first-person puzzle game where you are trying to escape from lab, what *Portal* does well is how it uses it environment symbol to introduce the mechanics early on in the game, so that player can understand the sign by its representation. With *Portal* it uses chapters symbol began of each level to describe what kind of environment and danger there is within the level. It also shows. What challenges they will be facing within that level, it also shows the player how many levels there is and what the current level they are in.



Portal the Test Chamber.

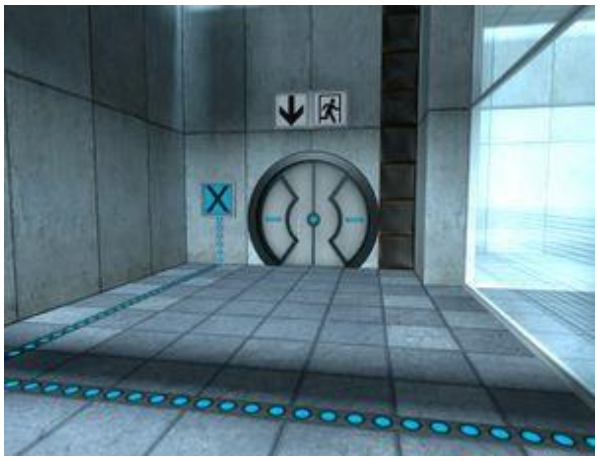
By keeping seeing the chapter symbols over again in the start of every level will create a repetition that the player will understanding what it means through the repetition which Totton mention it useful to do if the game designer wanted to create sign posting though environment symbols. As Totton (2014, p. 172) explains: “Each symbol must be repeated so the player learns what it means through repetition.”

When you enter the first room, you notice the pressure pad that can unlock the door but only if anything places on it otherwise the door remain lock, by this we start to learn that the cube is a sign for key to unlock the door, by known key sign is cube to unlock doors the player will take what it in represent and uses it sign whenever they see a cube.

With the pressure pad there is a sign indicating when the door is open or closed because of the colour dots and sign changes from cross to tick which is interesting because we take the cross sign represent as failed or got it something wrong as real life as a marking system so by taking

the represent cross sign as wrong the player will always know when they have not solved the puzzle right.

Another interesting symbol *Portal* uses is arrow and man running because the man running represent the meaning of nearest exit as it is places in all builds pointing to the nearest exit, as we take that sign.



When the player visits new rooms, they will see the symbols, then play the level themselves, as they are playing the levels they are learning which symbols correspond to specific mechanics (Totton, 2014, p. 175).

The gameplay that *Portal* gives you is portal gun and interact for the cube, when the player was first introducing to the portals it would be coloured blue and orange where they would use the gun to solve puzzles, when the player goes through any of the coloured portal they would come out wherever there is other side.

However when the player get the portal gun and shoot portal the player will not be able to go thought unless both blue and orange portals are shot, this give a sign to the player that the only way to go thought portals is to create blue and orange portals, so we take the sign and understand what the portal gun represent by using it throughout the entire games.

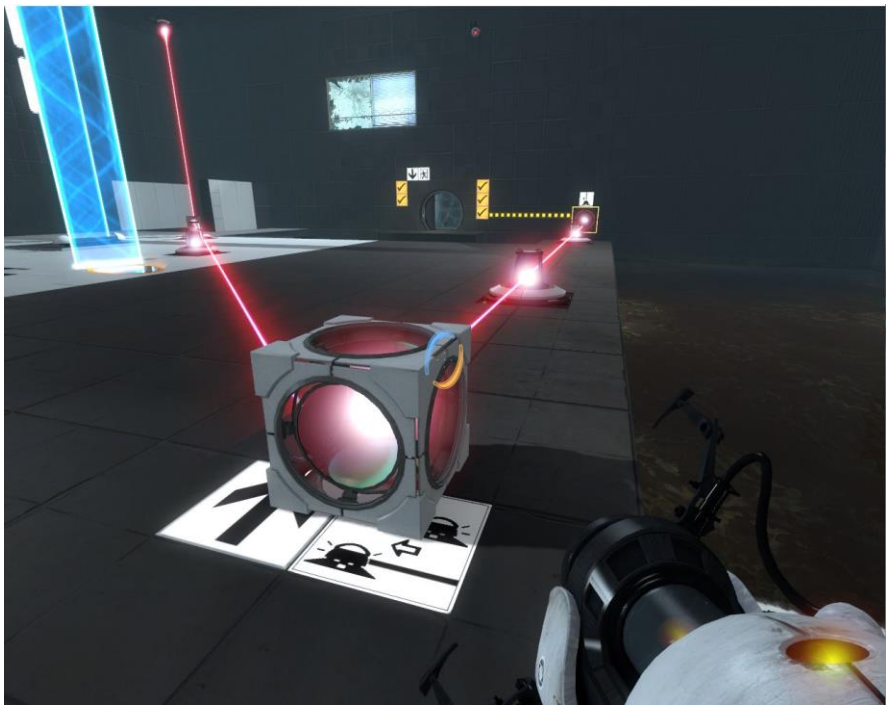
When using the portal gun it can only create portals on white surface and any surface that is black/grey the portal gun will not be able to create portals, with this it gives the player a sign of anywhere that has white surfaces is useful towards them and anything that does not has white is not useful to the player.

How the player creates portals.

The level design in portal has layers of symbol that occurs within the geometry itself, it where the player enters a room and seeing signs indicate inertia-based puzzles that help them to solve the puzzle when encounter the deep pit, wide canyon, and the white walls panels always being consistent within the inertia puzzle the player will know what actions they need to take. As Koster (2005) explains: “Fun in games arises out of mastery, it arises out of comprehension. It is the act of solving puzzles that makes games fun. With games, learning is the drug.”

In *Portal* the cube was a sign for key that need to go on pressure pad to open the door however in *Portal 2* mix the sign for key to laser relay that need to connect to laser catchers, this create new sign towards the player as the laser is coloured red and can harm the player if they touch it. When the player first encounter the laser puzzles they are introduce to new cube with mirrors which is uses to reflect the laser to the laser catcher, When we look at the mirror cube it give the player two different sign because it can be uses on pressure pad to unlock the door just like a normal cube however by it having a mirror on the cube it sign for reflection as if the player

was to stand in front of any mirror it will reflect in the directions it is facing, The player will understand the sign by its representation.



The Mirror Cube and the Catcher.

The way portal is using the signs is within the game itself because it shows how the mechanics work though repetition in each chamber, e.g. dropping a cube on a button and then allowing the player to do it themselves in the next chamber. It can be argued that these are symbols themselves and are repeated by the player to enrich their learning. With portal putting players to solving puzzle it creates a goal for the player to trying to escape the current test chamber into the next chamber it, which make portal challenging but meaningful because they are engage in problem solving with puzzles.

> This simple pattern leads to very interesting stories because it means the character has to engage in problem-solving, because conflicts lead to unpredictable results, in other words, surprises, and because the bigger the obstacle, the bigger the potential for dramatic change (Schell, 2015, p. 305).

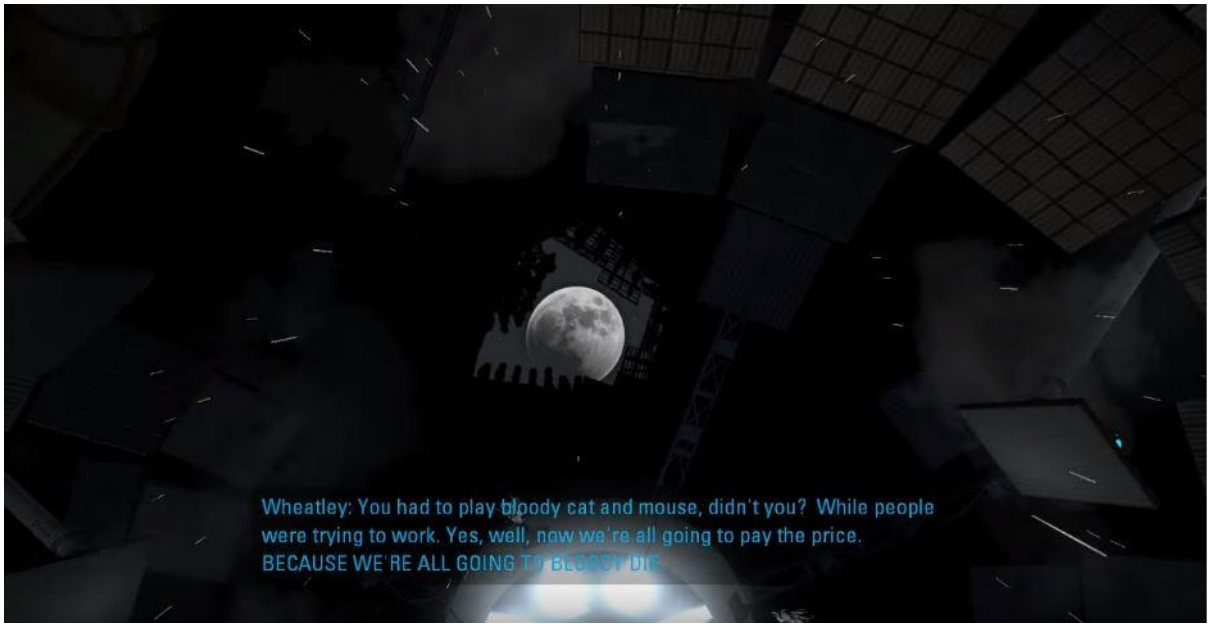
In *Portal 2* the player movement speed changes depending on which three gels the player steps on as all of the gels have different properties. The names of the gels in *Portal 2* are repulsion gel, propulsion gel and conversion gel.

The repulsion gel give the player an ability to jump even high and has a blue colour sign that give the player a sign of anywhere that has blue gel is repulsion gel, the propulsion gel give the player an ability to run fast to make the player fly cross to the other side of the platform and the propulsion has orange colour sign that give to the player anywhere that is orange gel is propulsion gel, and conversion gel is not really give the player an ability for movement but rather uses to create white surfaces which the player already know from the portal gun experience that anywhere with white surface is able to create portals.

With those gel use to give player ability to solve puzzle there was another gel that will wash another any of the gel if it touches it which is cleansing gel as it is just regular water as sign for water could be for drink or to clean up something that is dirty. When the player encounter those gel the player would take those sign by its representation thought it gameplay and know how to use it efficiently to solve puzzle.

The Different types of Gels in Portal 2.

When the player is facing the boss in *Portal 2* they have to uses the three-different gel to fight the boss, from previous levels that the player encounters the gels, they learn what the signs and representation are that get the player prepared to face to boss, in the boss battle the player has to create portal on the moon to defeat the boss, but the way this sign was created that allows the player to know they have to shoot a portal was because the way the camera was facing the moon, the player sees a white moon which gives the player a white sign which lets the player know what it means through repetition that anything white can create a portal.



The moon in the final boss battle in Portal 2.

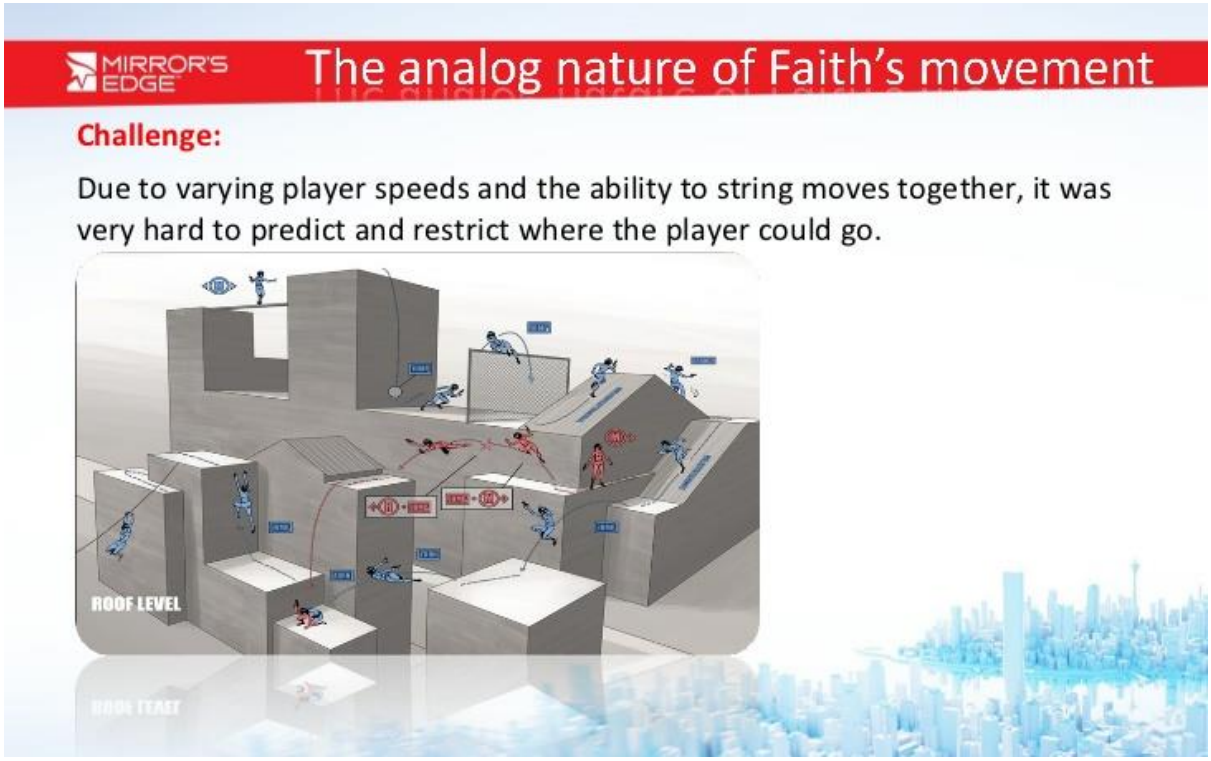
A level designer does is arrange the architecture, props, and challenges in a game in ways that are fun and interesting — that is, making sure there is the right level of challenge, the right amount of reward, the right amount of meaningful choice,

Mirror's Edge

Mirror's Edge is a first-person action-adventure platformer developed by EA DICE, it is a narrative free-running game where the player is free-running though obstacle to get to the other buildings. In *Mirror's Edge* it uses narrative lures built into the levels and focused on the players journey to guide the player. Schell (2008) discusses this approach to games:

> Linear. A surprising number of games are arranged on a linear game space where a player can only move forward and (maybe) back along a line. Sometimes the line has two ends, other times it loops back on itself. (Schell, 2008, p. 331).

Example of this in *Mirror's Edge* all the levels are linear as they have a start and finish, the player is free-running though the obstacle, but they have different way to complete them.



Level Design Challenges & Solutions - *Mirror's Edge*

In *Mirror's Edge* it introduced the mechanics to the players early in the tutorial level, what that doing is teaching the mechanic to players though visual symbols within the tutorial levels, by the player learning the symbols in the tutorial level though repeated playthrough and player learns what it means though repetition (Totton, 2014, p. 172).

With *Mirror's Edge* makes good uses of signposting to guidance's the player to where they needed to go or telling what happening to the story.

What *Mirror's Edge* make effective use throughout all the levels is how it uses bright red to highlight the objects that are interactable. It is also uses to guidance the player to where they need to be go (end of the level). Especially on the deliberately plain white aesthetic of the game

world (Raza & Carter, 2017, p. 209) as it makes the red stick out in the world and player will learn the red sign though repeated and what the sign is by its represent through repetition (Totton, 2014, p. 172).

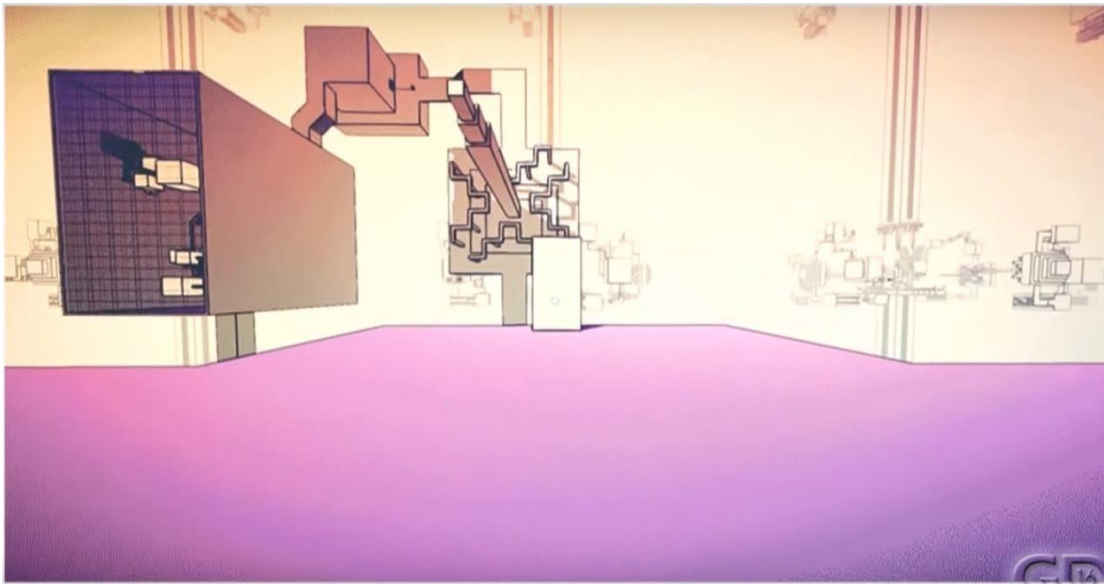
Therefore, *Mirror's Edge* makes it obvious where needs to go. It does not try to guide the player naturally by hiding hints of where to go in the environment, but rather shows the player directly where to go. However, following the Red elements does not always offer you the most efficient path to end of the level. Pushing skilled players to find new ways to reach the end quicker.

However, the game also pushes the player to find their own way through levels. This done is done by making the player repeat the same move in different situations. By doing that the players get used to certain patterns that the game will let them perform in places where there is no guidance. In other words, they are trained to look for new solutions and new paths to complete levels.

Ellis, P. (2016) Colour as a visual language in '*Mirror's Edge*'

With *Mirror's Edge* when the player enters the lift there is a monitor near the buttons, before the player interact with the buttons in the lift when they look at the TV monitor the player would be receiving information about what going on In the city, this give a signposting to the player when they enter the lift to look at the monitor if they want to learn more about the story though signposting. The enemy In *Mirror's Edge* has a symbol that tell player when the enemy are coming, they use a blue colour sign which can mean a sign for polices where the player would have the choice of either to attack the them or escape from them, but that not the only symbol the enemy has because when the player sees the enemy they are highlighted red that give the player a sign of enemies and the player will learn this sign though repetition.

Manifold Garden



Chyr's (2016) method of player navigation.

A developer William Chyr (GDC, 2016) demonstrating in his game *Manifold Garden* (for release in 2018), where Chyr explain his theory on how to tackle Impossible Geometry, in one of Chyr levels he design it where the player would need to go on the cube to progress to next

level, however, players did not understand the sign he try to represent so to player would get lost on direction they have to go.

Chyr's (2016) method of player navigation.

By adding the stairs instead of using the rectangular geometry give the player signposting of direction they are able to take or should be heading as it uses the environment symbols that gives a sign of a meaning towards the player that the stairs may be useful, in Manifold garden if we was to apply the method Schatz's of the three shapes being using are the basic shape circles, squares and triangle to define what is useful to the player, in the environment it wouldn't work so well because there isn't any diagonal in the geometry mostly round or rectangular.

Comparison between *Portal* and *Mirror's Edge*

There are different ways a level designer can use the signposting within the game space that can be taught though mechanics or visual language, with both *Portal* and Mirror Edge are good with using signs to guide the player though there levels, as *Portal* taught signposting though mechanics whereas Mirror Edge uses visual language to teach their signposting, in both *Portal* and Mirror Edge introduce there gameplay in the tutorial levels as *Portal* will get the player so solve puzzle to learn the mechanics and Mirror Edge uses colour as a visual language to guidance the player.

The levels design in both portal and Mirror Edge have architecture, props and challenges in ways that make it fun and interesting which Schell mention for good level design;

> A level designer does is arrange the architecture, props, and challenges in a game in ways that are fun and interesting — that is, making sure there is the right level of challenge, the right amount of reward, the right amount of meaningful choice (Schell, 2008, p. 343).

These case studies were also chosen because their mechanics had to be taught through signposting. An artefact was construed to test the theories in signposting.

Artefact analysis

This artefact was created to analyse the theories of signposting, it going to look on how you can use the signposting in the artefact. In the artefact it has the following mechanics; a rock climbing system and a cube with colour as a visual language that using signposting to guild the player though the levels.

With environment symbols and colour sign effective way to guild the player without the game designer help, *Portal* and Mirror Edge have a unique way of using sign within their game as we explore into how they use environment symbols and sign to create a fun engaging experience for player.

The rock climbing system was created in unreal engine 4 that uses red colour at the top of the rectangular shape model, the red colour is a sign to tell the player that it is a climbable object, in the rock climbing system it uses the colour as a visual language that the player can understand like in Mirror Edge which does a good job at using colour signs. If we are looking at an indoor rock climbing building, they use different types of colour grips to hold, that is to tell the climber the difficulty it is to climb, there are nine basic types of climbing handholds.

The rock climbing is following the method of Emilia Schatz "Defining Environment Language for Video Games" (2017) where anything rectangular may be useful to the player and Totten's symbol theory and visual communication (2014, p. 175). Other games series that uses rock climbing system such as *Uncharted* and *Tomb Raider* do follow Schatz's method of marking colour sign as climbing object or useful towards the player,

The cube in the artefact starts off with a white material but changes to ice material when it is places on a cold platform but when it is place on a fire platform it would change it material back to a white material. This is using different type of signs because the ice material is light blue we if look at ref we can see ice is light blue and slippery if the player walking on it, the player will understand the light blue for ice sign, when ice is under heat the ice will melt because when ice get hot it will melt it will change the cube to white material, on the fire platform has sign as the player knows fire burns and can hurt the player, the player will learn the signs and be able to understand representation.

Conclusion

In this research of player guidance through signposting in level design it shows why it is important to use signposting in level design to guide the player without holding their hand, as signposting can be uses in different ways with *Portal* and *Portal 2* make good uses of introducing mechanics early and conveying their message to the player for what actions to take throughout the game, this is good way of using symbols because when the player is learn the signs though repeated they will understand what they need to do and won't get lost , with Mirror Edge make good uses red colour as a visual language to guide the player throughout the game, by using the red colour sign the player wouldn't get lost on where they need to go as they learn the Mirror Edge sign.

The signposting in the literature give understand of the different way signposting can be uses in level design and what the level designer would need to consider when trying to create signs, when level designer is creating environment symbols it is important to remember there is two rules they would need to follow in their game;

"1. Each symbol must have a unique appearance, even from similar environment art objects.

2. Each symbol must be repeated so the player learns what it means through repetition." (Totton, 2014, p. 172)

Another method that a level designer should consider is Schatz method on how you can make your environment playable and understandable to the player, because it gets level designs to think about the three different shape that define what useful to the player (Round, Rectangular and Diagonal). The artefact that was created to demonstrate Schatz's theory in the rock climbing system.

With the artefact created to test the theory coved in the literature review it demonstrate that the theory in signposting is important to uses in level designs, as it is showing how you can guild the player through signposting, with Totten method of using the symbols to introducing the mechanics early on in a level design and Schatz method make your environment playable and understandable to the player, as the rock climbing system has red colour on rectangular model which the player learns that anywhere that has a red colour is climbable or useful towards to the player, the cube changing the white material to ice material that creates ice sign which mean it may be useful towards the player, also the fire material the changes the ice cube back to white cube.

Overall using signposting in level design is a useful way of guide a player though the level without making the player think you are ‘holding their hand’, as the player will learn the signs presented to them and understand the representation of that sign during gameplay.

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