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Visual Design of a Social Virtual Environment

Designing and Creating a Virtual Room for a Social Game

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<p>The purpose of this thesis is to demonstrate the process of designing a room for a 3D-avatar chat. The thesis is linked to a mobile game development project, called the Project X, which is a gamified avatar chat set in a virtual world. The setting of the Project X is a fictional luxury hotel, and the room that this thesis concentrates on is a cigar lounge-type public room in the hotel.</p> <p>The paper will start out by introducing some common player type categorizations. It will then move on to discussing what types of players are most wanted in a purely social game, and how should the different types be catered to. The paper will also touch on the subject of architectural theory, especially related to game environments and level design.</p> <p>The second half of this thesis goes over the actual room design stages, starting from brainstorming, to assembling the room in the game engine.</p>	
Keywords	Virtual World, 3D modelling, game environment design, Mobile game development

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2 Introduction

In this paper, I intend to study the process of designing a virtual room, keeping in mind that the purpose of the room is to be part of a social virtual world. The world belongs to a gamified chat application for a mobile device.

Sulake is a company, best known for their social virtual world, Habbo Hotel. Their next unpublished project is similar to that, but in 3D, and with significantly better design. I have been contributing to the project for half a year, and I agreed to conduct my thesis on the subject of virtual world chat room design. What I am especially interested in making a chat room, is endorsing social behaviour through user oriented room design.

Since the project is not yet published to the big audiences, and a lot of it is classified, in this thesis it is called the Project X. In short, the Project X is a gamified avatar chat. The player chooses a permanent nickname and gender for their avatar. At the moment, avatar customization is limited to modifiable skin and hair colours, plus an extensive wardrobe of purchasable clothes with unlockable colours. The target group for the game is adults and older teens.

The setting of the game is a hotel, set in the distant future. There are currently four public rooms and three secret rooms in the game, the library being the oldest and least used. It was agreed that the library should be replaced with something more appealing, so I agreed to do a design for a cigar lounge. Before starting the design process, I wanted to do some groundwork for it, and explore the concept of virtual worlds and social game design in general.

The game is first and foremost a social game, and the main activity in-game is chatting and making friends. The game is free-to-play, and monetization is based on in-app purchases. There is a mechanic for progression, a single player mini game where players can gain levels rewards of items and currency.

In this paper, I will map out some types of player behaviour within multiplayer games in general, and see how they affect the design process. I will also take a look how environment design affects game play, and how social game design has been taken into consideration in some other like games.

Terminology

MMO Massively Multiplayer Online game. My examples for this are Guild Wars 2 and World of Warcraft. Bartle also uses the word MUD (Multi-User Dungeon) (Bartle, 2004).

Mesh/Geometry a 3D-object in virtual space consisting of coordinate points known as vertices.

Materials and Textures Texture is a 2D-image containing detail, that is wrapped around a mesh. Material determines how the mesh is rendered, and consists of textures and shaders.

UV-Map coordinates in 2D space that determine how textures are wrapped around the mesh.

Game Engine, Unity Game engine is the coded platform that the graphics and content is built on to make the game. There are several premade engines available, Unity being one of the most noted ones.

World Building process of designing a fictional world.

Art Deco and art movement characteristic of the 1920s.

Light map a texture layer for light and shadow on static objects, calculated by the game engine.

Vertex Colour colour information applied directly to the vertices of a mesh. A very cheap way of colouring objects. Works best with large single colour areas, that can be created with geometry.

Active Points/Furni Furni is a term coined by Habbo for an interactive 3D-object with a specific animation assigned to it. Chairs are the simplest of furnis animation wise, as they only require a sitting posture. To differentiate between the terms, furni refers to the actual 3D-object, whereas active points are locations for furni based activities.

3 Designing a Virtual World

3.1 Player Segmentation

When designing a virtual world, one has to keep in mind, who the target audience is, and what kind of people the world will need to function.

There are several player types categorizations available, the most noted one being the MUD player type analysis created by Richard Bartle. Bartle divides players into achievers, socializers, explorers and killers. Killer-class aspires to make the life of other users difficult. They thrive on the sense of superiority over other players, which they get

by being cruel to others. In the traditional PVP surroundings, they express themselves by beating other players, but in a social non-PVP world killing is replaced by psychological abuse. In Project X, and other social environments like it, the killers are more aptly described as bullies. (Bartle, 2004. 130)

In light of the Project X, I would compile that achievers are the ones that grind through levels to get currency and XP, buy the most expensive clothing and colours, and showcase their material success. They are also the ones most likely to buy things with real life currency. Socializers do not care that much about material wealth but instead spend their time mingling and roleplaying. As of yet there has not been much room for explorers to exhibit themselves but certainly, once the hotel backstory is better implemented, those will be had too. They would be the ones solving puzzles and uncovering mysteries related to the world.

Another widely used segmentation is made by F. Randal Farmer. Farmer was the system administrator of Habitat, a pioneer in graphical virtual chatrooms. He devised his own user categorization purely for inspecting different types of social behaviour in games. Passives, who log in every once in a while; actives who are logged in a lot; motivators, who like to organize clubs and events; and caretakers, who like to help the actual staff by voluntary and informal moderating.

As a final group Farmer lists the "Geek Gods", who are actual moderators and developers. Whether or not the staff should be included in the system is debatable in my opinion – staff seem to be excluded in most statistics – but I have to agree, that their occasional online visits do have an effect on the overall social dynamics. The staff seem to be considered as celebrities, and players take pride in having frequent interactions with them. (Bartle, 2004. 135-148)

Habbo has segmented their users slightly differently. Their segments are very heavily linked to the activities there are in Habbo, socializing being the most important feature. Other activities include trading, room building and avatar appearance changing. Many of the Habbo segments can be put under a Bartle label, however, the Habbo method does not seem to recognize explorers as a separate group. That might be because the world of Habbo is very fragmented, and most of it is built by users. There is not much for the explorers to achieve.

Roleplaying in a virtual world environment does not necessarily mean one has to pretend to be someone else. Roleplaying enables displaying different facets of one's own personality. Roles are present in our everyday lives. We all act differently depending on who we are with. The social dynamics within a group solidify quickly, which is why it is so important to find a comfortable role as soon as possible. Once settled, the dynamic is near impossible to shift.

Interacting with other people behind a veil of anonymity allows players to present their ideal selves. It can be noted, that people with difficulties connecting socially in real life, can become extremely social and popular in a virtual world. That may be the secret to the popularity of communities such as Second Life, where people can build a whole new life and identity for themselves online.

Premade setting of a virtual world can enhance social interaction, even when not consciously playing a character. Project X is set in a hotel with play areas such as a restaurant and a beach. Even though the places are merely 3D art on a screen, the concepts they represent are familiar to most of us. Socialites gather in the hotel lobby, which tends to be the most crowded of the public areas. In the restaurant area, there is more actual roleplaying, as some of the people pretend to be chefs and waiters, and others come in as customers. This sort of childlike play behaviour is sometimes frowned upon by the more "mature" players.

At the moment, the avatar customization in Project X is very limited, character differentiation is achieved with gender, skin colour, clothes and hair. In many roleplaying oriented games, and especially in MMOs, appearance and backstory are vital in character creation. In Project X everyone's appearance and backstory is the same, however, actually roleplaying a hotel customer is quite rare.

In MMO games such as World of Warcraft and Guild Wars 2, it is possible to have multiple characters on a single account. In those games it's an important feature, because the basic character attributes are permanent, and playing with multiple character types enables more variance in the playing experience. Since everyone in Project X pretty much looks the same, the multiple character feature is not seen as necessary. Despite this, there are players who create multiple accounts. One reason for this is so they can have both, a male and a female avatar.

3.2 Attracting the Desired Player Types

Bartle calls players “intangible content”, meaning that they are a content that developers can affect very little (Bartle 2004, 55). There are some methods however that can be used to attract certain types of players, even if actually controlling the players is difficult at best.

In virtual world creation, designing the world itself is the most fundamental part. Game designers write the setting and backstory for the world, and artists create the visual representations of their designs into the game. In MMO games like WoW and GW2 a major part of attractiveness comes from the world design. For many people the art style of the game is a huge criterion, when choosing whether to play it or not.

Players don a character and act under a cloak of anonymity. Their character’s appearance and story rests on the setting. In GW2, for example, one can choose a gender, a race and a profession for one’s character, and customize its appearance extensively.

The basic backstory is then provided by the game, for example, if the player starts as Sylvari (a tree-person), they begin the story by waking up from a dream, in which they have spent all of their life thus far. The player is then taken to meet the leader of the tree people, who divines their destiny as a dragon slayer. Some players like to extend their roleplaying beyond the designer-written story, and invent a history and personality traits for their characters.

Project X has a written backstory, but so far the implementation of it has been very superficial. The game is set in a luxury hotel in a distant future, that is very similar to our world. The whole extent of the dissimilarity is as of yet undetermined. The visual style of the hotel is very Art Deco influenced and some of the clothing items have a 20’s flare to them. Sci-fi elements are somewhat visible in the form of robots that inhabit the corridors of the hotel.

In most MMO games the player’s learning arc is heavily dependent on exploration. Project X’s game mechanics are quite simple, and so far there has been no need for a separate tutorial. Likewise, in Minecraft, a popular sandbox game by Mojang, hints and guides are compiled in wikis by other players, which has resulted in a rich community. In a way a good online wiki can make a game a lot more engaging, than an in-game tutorial.

However, in Project X, learning about the world itself has so far been difficult, as the hints are so scarce. There is very little to do for an explorer-type player. In addition to the public rooms, there are currently two secret rooms in the game, and it does not take much effort to find them.

Explorers thrive on uncovering secrets, and the story of Project X has a lot of potential for secrets. Secret rooms and puzzles are a popular way of keeping explorers happy. Visual hints of mysteries in room decoration can do a lot. Some of my sketches had an image of an elephant in some form or another. It was intended as a conversation starter and possibly a mystery. Players would wonder if the elephant held some importance, or was it merely decoration. Some would find the literal pun of “elephant in the room” hilarious.

Achievers want to showcase their wealth, and the most obvious method of catering to them is to have plenty of things to buy, and achievements to collect. However, the economical and psychological reasons for in-app purchases are not included in this particular study, as they do not relate to the visual representations in the game. The main currency sink in Project X is clothes, and the more appealing the clothes are, the more expensive they tend to be.

Killers/bullies are a troublesome group. In many games their presence is unavoidable and sometimes even vital. In a purely social game the bullying behaviour is most often unwanted. Killers are drawn to games with lots of achievers and socializers, whom they consider as prey. Explorers hold much less interest to the killer-type player. Thus the balance of killers vs. other groups is best shifted by increasing the number of explorers. (Bartle, 1996)

Social people are drawn to other social people and social activities. There are not many game induced social activities in Project X. Most social activities are player initiated, such as fashion shows and role playing. One can of course role play alone, but as with fashion shows, the more the merrier.

There used to be a stage in the previous iterations of the lobby, that players used for their fashion shows and dance parties. The stage was removed in favour of a gaming area, and the players moved their show hosting to the middle of the lobby floor. The new public room could apparently use a stage.

3.3 Virtual Architecture

The most common use of virtual architecture is for visualizing a realistic place. It seems like a good and modern way of showcasing architectural designs, instead of building physical miniatures. In those instances, sticking to realism is somewhat more important. The design should be possible to be replicated in physical form. Architectural visualization is of course used for selling ideas, so often some of the functional, but unflattering elements are left out. In games, building the right atmosphere is of the utmost importance, not copying something that works in real life. Rules are meant to be broken, as the saying goes.

Husserlian phenomenology states that people have two bodies, one being the scientific object of a human body, the other of human experience based on senses and identity. A person does not simply exist in a certain location, but is spread about the room and inhabits a whole space with their senses. (Passinmäki 2011, 134) The idea of playing a roleplaying videogame or using a multiuser avatar chat is very similar. An avatar or a game character can be seen on screen, and it resides in a certain point in its surroundings. However, the player is a godlike being that exists beyond the boundaries of the avatar's visual representation. The player can inhabit the game through immersion, without having to be inside the game physically.

In a similar way, the traditional theory of architecture differentiates between lived space and geometric space. In poetic architecture, the need for geometric space arises from the incomplete state of lived space, lived space always being what the designer must aspire to create. The design process begins in a situation, where lived space exists as a seed or a "spark", and the job of the designer is to bring that space into existence. Poetic creation is receiving and answering. Rather than taking off from a single thought or idea, the designer uncovers the space from a "fragmented cluster of experiences". (Passinmäki 2011, 140)

Designing a virtual space can be somewhat similar to designing a physical one, but the opportunities and limitations of the two can be very different. A physical building has to abide to the laws of physics, and often functionality precedes aesthetics. Function is of course important in virtual architecture as well but the functions differ greatly. In a physical lounge, there would be chairs to sit on, so people can rest and be comfortable.

Virtual chairs have nothing to do with physical comfort, but rather they give the avatar a valid location to stay still.

Sitting is perceived to be more socially acceptable than standing around in random spots about the room. Standing draws attention, and while not physically uncomfortable in a virtual place, attracting excess attention can cause psychological discomfort to the player. Sitting is also a minor form of roleplay, such as other gestures, that can be used to communicate certain type of behaviour or current status. Sitting with friends also enhances a sense of belonging.

When building physical walls, they usually have to be somewhat straight, to keep from toppling over. Building walls of any other shape requires extensive mathematical calculations and knowledge of physics. Virtual walls can be whatever shape pleases the eye, and building them requires next to no architectural know-how, just the use of a 3D-program.

However, keeping the buildings somewhat relatable can increase immersion in a game. The designs should reflect at least some recognizable features of real life environments. In many sci-fi and fantasy games architectural elements are reminiscent of some existing real world cultures. In GW2 the architecture of Norns, Nordic giants, is heavily influenced by Viking and shamanistic cultures, while the human city seems very Central European. The area's architecture style reveals much of the culture and society that inhabits it, and recognizable elements enable larger scale assumptions of said society.



Figure 1. The architecture in Divinity's Reach, the human city of Guild Wars 2, is easily recognizable as very Central European.

An enclosed place in a physical world needs walls all around it, but in the case of Project X, having walls in every direction of the cigar lounge is impractical. The side towards the camera will need to be left open. Whether the open space represents an invisible wall or a ravine, is left to the players' imagination. Some hints can be given by tactical placing of lights; if the edge is well lit, compared to the rest of the room, it will enforce the openness, creating an illusion of perhaps windows or a glass wall. The imaginary wall can also throw shadows on the floor, and that can be useful, if the knowledge of existence of the invisible wall is deemed important enough, that it needs to be shown.

Scales of objects are often exaggerated in virtual worlds. Whether or not objects are proportionate to the avatar is not as important as how they look in the world. Important elements can be made bigger than realistic to help draw attention. Camera distance and device screen size are more important factors when determining sizes and proportions, than the actual avatar size. If an object is going to be hardly visible, there's not much point in having it there at all. Unless the thing functions as an Easter egg of sorts.

Any architectural design, be it a house or a level in a game, begins by there being a need for something. The need for the design should be mapped out and always present in the design work. The difference between an architectural idea and an architectural device is, that an architectural idea is the cause for the design, and the device a means for filling a need (Chen 2001, 1). In the case of the Cigar Lounge, my idea is to create a room for endorsing social interaction between players, and my means of doing that is by making a virtual space with seats and activity points in certain locations.

Creating intuitive paths is essential in level design. The path that a player travels is a vital part of the game experience. The player gathers information of his surroundings in the order that the information appears to him. In the linear level design that order can be imposed on the player by the developers, but in open world the choices a player makes can make quite a difference in the game experience. The player's choices can be influenced to a preferred direction by placing objects of interest along his path. (Nerurkar 2009)

Entrances are extremely important in that they give the first impression of the room to the player. They are also an area for the player to gather themselves and take in their surroundings before advancing into the room itself. Even if the overall feel of the room is intended to be cluttered and hectic, the entrance area should be left relatively calm.

In real world, buildings have areas designated for transition, such as stairs and corridors. Their only function is for a person to move from one area to another, and so they are often not considered as areas themselves. In a game however, transitioning between places does not necessarily require a separate transition area. Loading screens and teleportation are a very effective method of avoiding excessive walking. A game level to have stairs requires an alternative function for those stairs. They can be purely decorative or they can be an object of interest. The presence of stairs can give hints to the nature of the room, or they can be used to separate one area from another.

The article, *The Architecture of Level Design*, presents five different organizational devices; centralized, linear, radial, cluster, and grid. A centralized organization is reminiscent of a map of a medieval town. The level is built around a point of interest. In a linear organization, the path is often very predetermined, the major area of interest being something like a street or corridor. Radial organization has multiple points of interests placed around a centre point. Many similar points of interests placed together are called clusters, and evenly distributed identical points are called grid. (Chen 2001, 3)

In a chat room, players are meant to explore and wander, so a linear organization of the room is out of the question. The most optimal organizations for a chat room would be centralized, radial or cluster, depending on the room function. Cluster would work best for a large room, with lots of action points, but for a rather small intimate underground jazz bar, I would go for centralized or radial organization, or a combination of both.

3.4 Social World Design in Other Games

Single player fantasy videogames tend to be single use items, such as novels. The appeal of multiplayer games however, rests on more than the given story. Bainbridge compares *WoW* to chess in terms of complexity. The substance of the game will only increase once the rules are learned. *Azeroth*, the setting of *WoW* is a culturally rich world and the game itself appears to be so complex that it will most likely stay in the memory of our civilization for many years to come. (Bainbridge 2010, 206)

Economy manifests itself very differently in virtual worlds than it does in real life. In *WoW* and *GW2* each player starts out with the same resources and are presented with the same opportunities of advancement, regardless of the player. The virtual world societies are anarchic in a sense that all players are equal and with near unlimited freedom. In

that respect, Project X is very similar. Players come to the game as equals, and their potential for progression is the same.

In MMO games, high status can be achieved by playing and money-spending. Some games support guilds, that are micro societies within the game. Advancement within a guild is social and largely dependent on other players.

Habbo was initially designed for socializers. In the year 2000, when it was first released, the only activity in Habbo was basically hanging out in the rooms and talking to other people. Other small game-like mechanics were gradually introduced, such as progression through room decorating. But even then, socializing has always been the main part of playing Habbo.

Habbo has different rooms for different activities and interests. The rooms are mostly created by users to reflect their own interests. For example, if a user is really into Dungeons and Dragons, they might name their room as a reference to a D&D place and decorate it with dragons. That way the room will attract other D&D-hobbyists and fantasy geeks.

Guild Wars 2 has city areas and character home instances, that are battle-free, and often in central locations in the world. People group together near crafting stations and merchants. Even though conversations between strangers are not common, many people in one area, doing the same things feels like a community. Conversations are usually about crafting recipes, events and guild memberships.

Adventuring with a party of people is typical for roleplaying games. In MMOs the party consists of other players. Forming a party in GW2 is totally optional, although some activities, like dungeon runs, are designed to be played with a party of maximum five people. Players in a party are not required to be friends, or even know each other. Just to work as a group. Different classes have different strengths and it helps if the party has players from varying classes. Traditional Holy Trinity (tank, healer and damage dealer) can be achieved from multitude of building blocks.

In adventure type MMOs, the killer-group from the Bartle player segments is often kept separate from other groups, by having separate player-versus-player areas designated to them. In Runescape the PvP area was called the wilderness, and going there was

rarely required for progression. In other games PvP matches can be organized events that take place in an arena.

In single-player fantasy games, characters are largely determined by the game world and story. MMOs add a social aspect to character building. In addition to scripted story choices, the player can choose to act in regards to other players as they please. The roleplay can be consistent, in that an evil character that makes selfish and uncaring story choices, will also be selfish and uncaring towards other players. Or the role can be switched off, when interacting with other players.

In many games, alignment is an essential part of character identity. Characters form factions based on their alignment. Alignment can be recognized through visual cues, such as dark/light colours, thorns/flowers or leather/feather wings. Although appearance does not make a person good or bad, appearance is an important part of identity, and it can be used to communicate identity to other people.

Character customization has evolved a lot these past few years. For many people the character customization plays a crucial part in whether the game is interesting or not. The gaming experience and immersion has a lot to do with the player's ability to identify with the character.

Roleplaying games are also a wonderful way to affect the ideals of the user base. People can learn ethics through roleplay and making choices related to the storyline. The ending is often predetermined, but the player can make varying choices along the way.

In games where progression happens through story, events happening in a certain order is important. Games and levels have increased in complexity over the years, and directing players towards their goal has become a central part in game design. This is done by placing hints along the paths the players are most likely to take. Players are most likely to go towards objects that clearly stand out from their surroundings. This can be used in guiding the player to a certain direction.

4 Room Creation

4.1 Brainstorming

Designing the room started with brainstorming some words and ideas on paper. Keeping in mind that the initial inspiration source is Art Deco and 1920's science fiction, I wrote down some design elements and references to that specific niche. I was heavily inspired by Tracy J. Butler's *Lackadaisy*-comic, and even screen capped some panels with relevant architecture. I also conducted an internet search on some era appropriate patterns and ornaments, that could be used as inspiration.



Figure 2. A panel from the comic *Lackadaisy*, that depicts an underground Prohibition era bar with an appropriate atmosphere. Copyright 2016 Tracy J. Butler.

The working title for this room was “Cigar Lounge”, which has since been changed, as we do not actually want to promote tobacco consumption. Also it is a very boring place holder name. The setting of the virtual world being a luxurious art deco influenced hotel in a distant future, we want our cigar lounge to be simultaneously cosy and luxurious. The balance between roundness and angularity is consequential, as round shapes are often associated with comfort and friendliness, while hard angles can be associated with style and modern luxury.

A good way to start with brainstorming is to aim high and dream big. Plans need to be iterated anyway, limiting one's ideas from the start is more of a handicap than anything else. Do not clip your wings too early.

I wrote down a bunch of ideas that I would love to see in the room, were it made with unlimited time and resources. Among those were animal motifs, tiffany stained glass windows, Harry Potter-like animated painting, ornamental prints everywhere and a ceiling made of hanging curtains. The final product does have a stained glass window

and a ceiling curtain, but not in the scale I had initially fantasized. Also with paintings I had to settle for good old fashioned still pictures.

Homes tell much about their inhabitants. A cluttered room communicates an inhabitant who is maybe a hoarder, a very unorganized person or has a very busy life. Straight lines and ascetic interiors tell of a person; to whom it is important to be in control. Hard edges and straight lines are associated with discipline, comfortable pillows and soft warm colours make the inhabitant seem pleasant and welcoming.

Objects have a personality. Gaston Bachelard has studied poetic architecture through literature, and in one of his studies he compares closets to tiny homes. A closet can hold life within itself. The contents of a closet can reveal much of the person who owns it. However, the content of a closed or locked closet is always more valuable, as the secrecy itself is of the greatest value. (Bachelard 2003, 199-216)

Disney's *Beauty and the Beast* took personifying furniture to the extremes. However, associating adjectives usually used on people with inanimate objects, is very common in atmosphere design. So I imagined the cigar lounge as a person, and wrote down some descriptive words for her. For I imagined that it was in fact, a she.

"She" is a sleepy place, but not disgruntled. She is kind, but also very secretive. She is thoughtful and proud. Sometimes she is playful, but most of the time she is warm and caring. She is a passionate musician and she adores creativity and talent. She is one of those people, who like to know everyone important. She is a socialite like no other. Romantic, but also very practical.

It is always a good idea to play with contrasts. Almost everything in our perception is relative. The fire seems all the warmer when it's cold outside. A good trick to make a room seem dimmer than it is, is to let a tiny bit of light in through the windows. Not enough to actually make a difference, but just so that it's clear, that the outside world is much lighter.

Curves and arcs are warm and welcoming, if indeed people become the space they inhabit, then people in round and soft rooms will feel a sense of warmth. Warmth can also be produced by colours and lighting. Dark Colours give an air of mystery, while deeply saturated colours can appear expensive and luxurious. Too much saturation,

however, can be painful to the eyes and psyche. Too much darkness can in turn become dank and colourless. Desaturated colours tend to be boring and apathetic.

The entrance door for cigar lounge resides in the lobby, close to player spawning spot. That means, that it may well be the first room besides lobby, that new players will go to. As such, the lounge needs to be interesting and *noobfriendly*. I would consider noobfriendliness to be achieved with a coherent flow and a welcoming atmosphere.

4.2 Concepting and Design

What I knew about the room when I started this project was basically, that there would be a clothes shop somewhere, a bar, and a bartender NPC. There was a rough character sheet of the NPC already existing, that basically just defined him as a bearded male with tattoos. His personality was still very much a work in progress, and much of it would be based on the room design

The architectural idea for this project was a social public room, identifiable as a cigar lounge. Architectural devices could be something like a bar, a carafe of cognac on a visible spot, lounge chairs and bookshelves. The overall art style is also an important factor in room identification. Although cigar lounges tend not to have staff, the presence of the bartender NPC does endorse the impression of a shady jazz bar.

Past experience regarding players' behaviour in Project X has shown me, that people tend to crowd near entrances, so my first thought was adding a sitting area right next to the entrance. It would be helpful for newbies as well, having people sitting around as the first thing they see, when entering a new room. However, having all the people crowding around a single spot is something we wish to avoid. Making the entrance area sufficiently small might help spreading the populace more evenly.

I also wanted to keep the entrance area sufficiently calm, so as not to frighten away confused newbies. Other people should be visible from the room entry point, but not crowded around the entrance.

Another thing I have noticed from observing lobby behaviour, is that players like to line their avatars up on balconies and floor edges, so they can easily admire themselves next to other avatars. I made my first designs include some balcony type tiers, with the idea

that variance in floor elevations may also help with dividing the room into distinct sections.

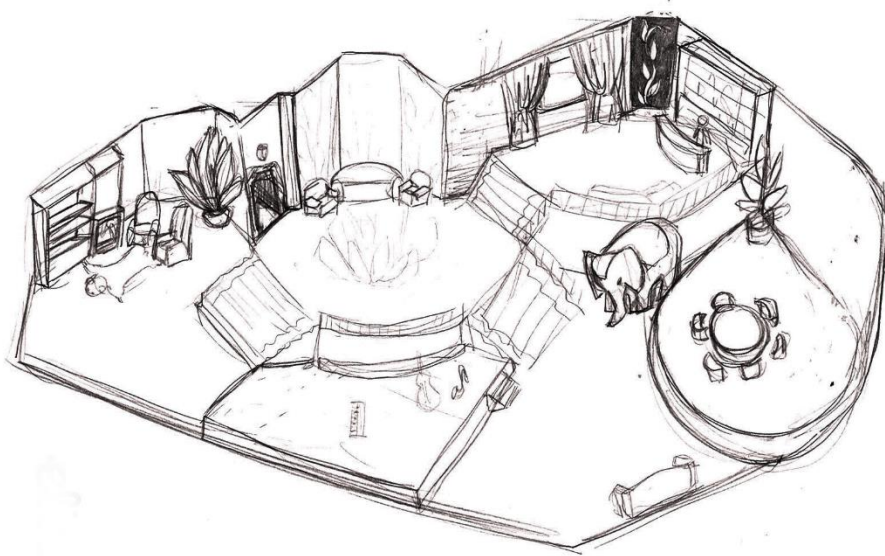


Figure 3. Example of an early sketch including the "elephant in the room" -pun.

When designing game environments, best way to start, is to establish the overall shape of the area by drawing a ground plan. This helps to place objects in coherent locations and the player's intended path is easier to map out in 2D. (Gahan 2011, 275).

Intuition and trust in one's instincts are very important for a designer. A bad design can cause an unexplainable sense of wrongness in the designer. A feeling of discomfort, that can even be experienced physically. In order to achieve a perfect design, while designing, the designer should strive for feelings of comfort and relaxation emanating from the designs. (Pallasmaa 1989, 26)

A good way to approach a design assignment is to sketch several versions, and let the customer choose the one that best fits their need. The difficulty with this is to come up with different things, that could all fit the bill while being diverse enough. If there is not a clear direction in the beginning, the first drafts are for sampling possible directions. With the cigar lounge assignment everything was very vague at first. Everything from the size and purpose of the room had to be invented.

Feedback is of course important, but one has to keep in mind, that not everyone can be satisfied. There will be endless amounts of opinions and suggestions, but a line has to be drawn somewhere. Trying to please everyone will often result in a cluttered, incomprehensible mess, that will end up pleasing no one.

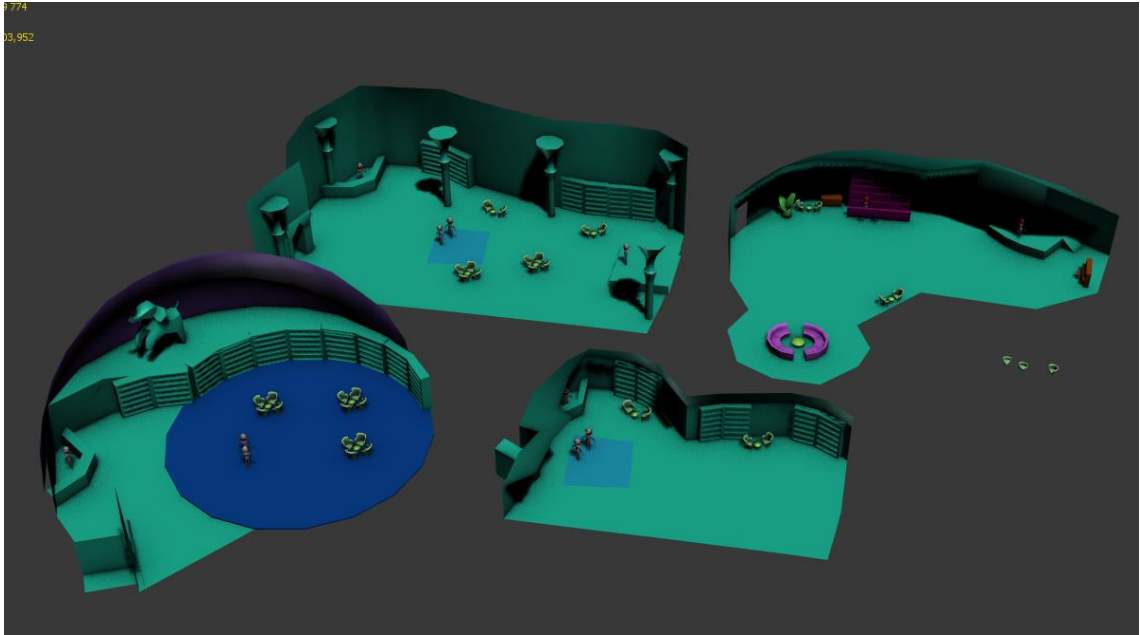


Figure 4. Blocking out variances.

I started the mood concepting by drawing some pencil sketches of possible rooms and interior decor. My first drafts were perhaps too detailed, as I was mainly aspiring to get the general atmosphere to my liking, and didn't much concentrate on making a realistic game scene. After the initial sketches I moved on to blocking room shapes in 3dsMax, as I figured moving the blocks around to try different things might be easier in 3D. The block outs could then be drawn over in Photoshop, as I have done in the image below.



Figure 5. A drawn over 3D block out

Eventually trying to design rooms from blocks proved insufficient, so I moved straight to prop design. I figured having nice looking furniture would make the overall room designing more enjoyable, and it would not hurt to establish some design elements early on. I have found Pinterest to be a wonderful source of inspiration, when it comes to designing anything. So I searched Pinterest for jazz-lounge type rooms and furniture, and the results were plenty.

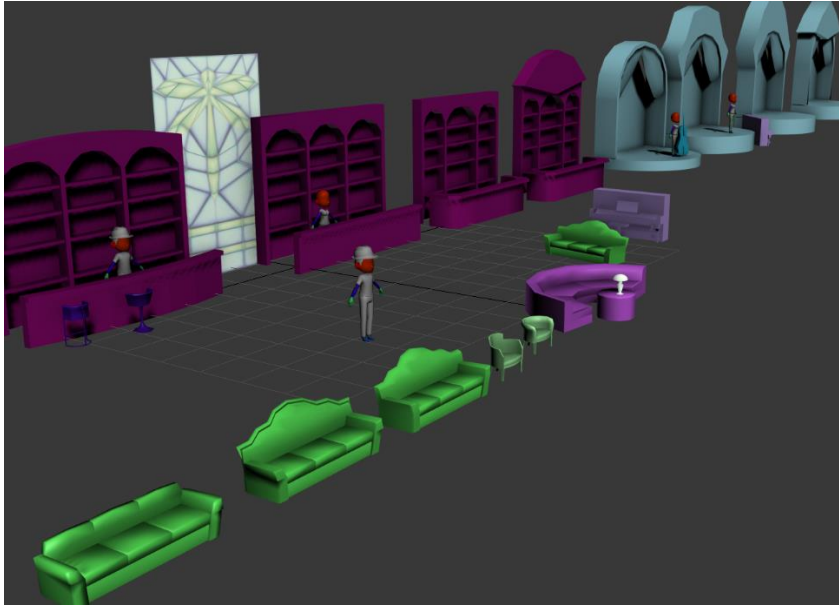


Figure 6. Simple props for playing around with the interiors of the cigar lounge

In order to pinpoint the atmosphere of the room, I modelled some example furniture. I tried to make the furniture look fairly finished, so they would represent my thoughts on the design as closely as possible, without having to do too much extra work.

Moving furniture around and making changes to the room shape proved to be much easier in 3D. The drawback with using premade blocks was that many of the block outs ended up looking very similar.

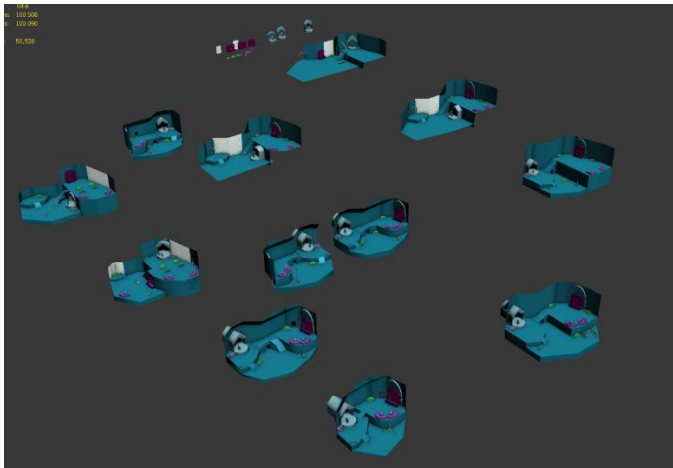


Figure 7. Experimenting with block outs.

So much of the ultimate feel of the room will be defined by textures and materials used, and as much as I would have liked to make several finished versions of the room, it just would not have been practical. Instead I made some paint overs on a few of the block outs, to bring colour into the designs. Paint overs are also a useful way to communicate plans to non-3D-artists.

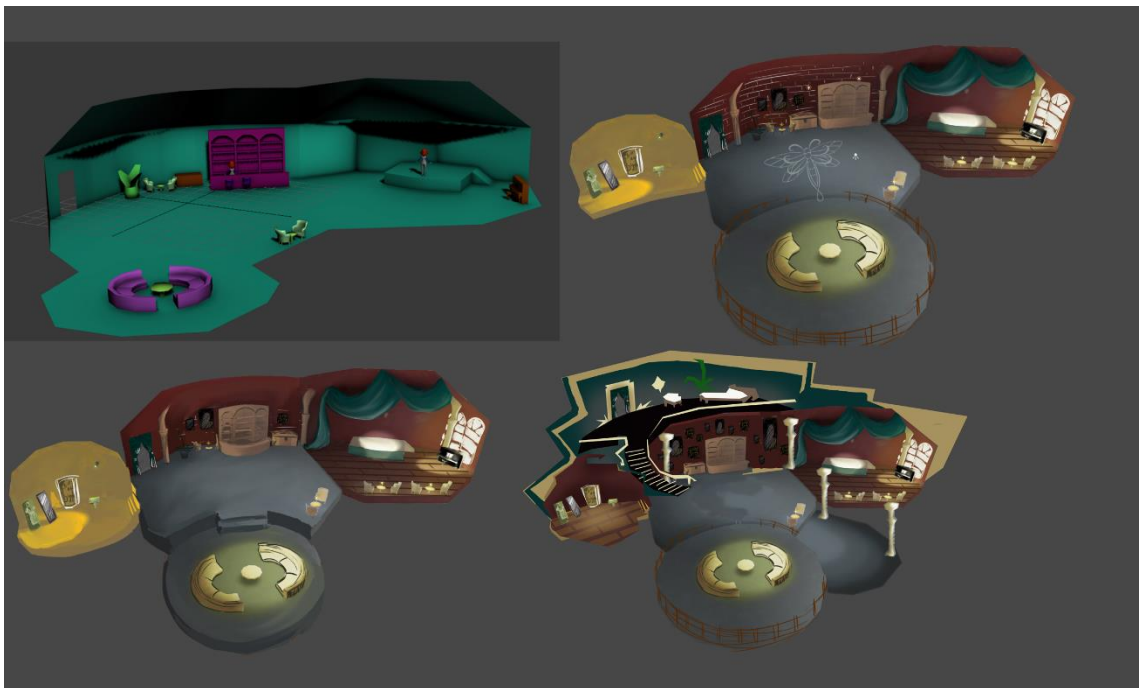


Figure 8. Iterations with paint overs.

A block out was chosen by popular vote, and iterated with paint overs. The final design ended up being a combination of these iterations. Adding stairs and moving the entrance

on a higher level proved to be a good method of making the room seem larger than it actually is.

I wanted to use the central or radial organization type in my design. I figured the bar to be the most eye catching element, so I placed it in the centre of the room. The other isles were then aligned surrounding the bar area. The entrance residing above the central bar area helps forming an intuitive path. The bar is not entirely visible from the entry point, but enough to spark curiosity in the player. The stairs, however, are the first thing that the player will see upon entering the room, and will thus encourage the player to wander further.

In addition to placing the stairs near the entrance, I further defined the flow of the room by placing the isles so, that each will be clearly visible from the previous point. The bar is visible from the stairs, and the stage is visible from the bar. This way the path should keep explorers interested, as they enter the room for the first time. Some of the most important areas, such as the stage and the shop area, are also highlighted by spotlights to make them more appealing.

I had a lot of trouble with the level of realism in my concepts. I seem to be inclined to design things overly realistic, which does not fit the art style of Project X, which is very simplistic. Many of my early concepts also had too many textured objects. Other rooms in Project X use textures very little, and a lot is done with just vertex colour.

As the room is going to be a game environment, and mainly looked at from a certain perspective with a limited field of view, it is important to take the camera angles and proportions into consideration as soon as possible. Trying out the block outs in the game engine helps a lot, and that should be done as early as possible. Changes can always be made later on, and they are best justified with testing results.

To make the room especially enjoyable for explorers and socializers, it needs to have at least some active points to endorse roleplaying. Active points in other rooms, such as the restaurant and the wine cellar, have been a huge success even for non-role-players. As we released the wine cellar at the end of January 2016, players were queuing for the active points, which seems to imply, that active points are a well-liked feature.

The cigar lounge has two main active points, although there would have been potential for more. I wanted the lounge to have a stage and a piano, so the actions I deemed most

fitting were singing on the stage and playing the piano. The stage and the microphone spot are also multipurpose, in that they can be used for hosting fashion shows and dance parties, which already are a big part of the players' social behaviour.

Achievers would mainly be interested in the clothes shop, and the opportunity to display the expensive clothes they have acquired. The central area, right in front of the bar, seems the best area for being on display. I would assume achievers and socializers to manifest in the same areas, as they are mutually beneficial.

I wanted to use the opportunity to further world building. As I said earlier, the hotel in Project X has a story, but very little of it is visible in the game. In addition to the NPCs already present, there are some written characters related to the history of the hotel, that have not yet been seen anywhere. I chose one of these to paint a portrait of, to be put on the wall of the lounge. The portrait itself will have no explanation, because I am hoping that it will spark conversation and fan theories among the players. Placing it near the entrance should also serve as an invitation for the explorers to wander further in.



Figure 9. Portrait of a mystery character, I painted for the cigar lounge wall.

Other art pieces include art deco influenced pictures of hover cars, a commercial poster for a fictional winery, and some cut-outs from fashion magazines in the clothes shop area.

The shops in Project X are stylized vending machines, that could be placed anywhere in the world. The clothes shop in cigar lounge would be selling the most expensive and sought after clothes. I wanted to make the surroundings of the shop reminiscent of a high class vintage store, situated in an underground space, to make it seem a bit more exclusive. As with most of my designs regarding the cigar lounge, the shop area also went through some iterations.

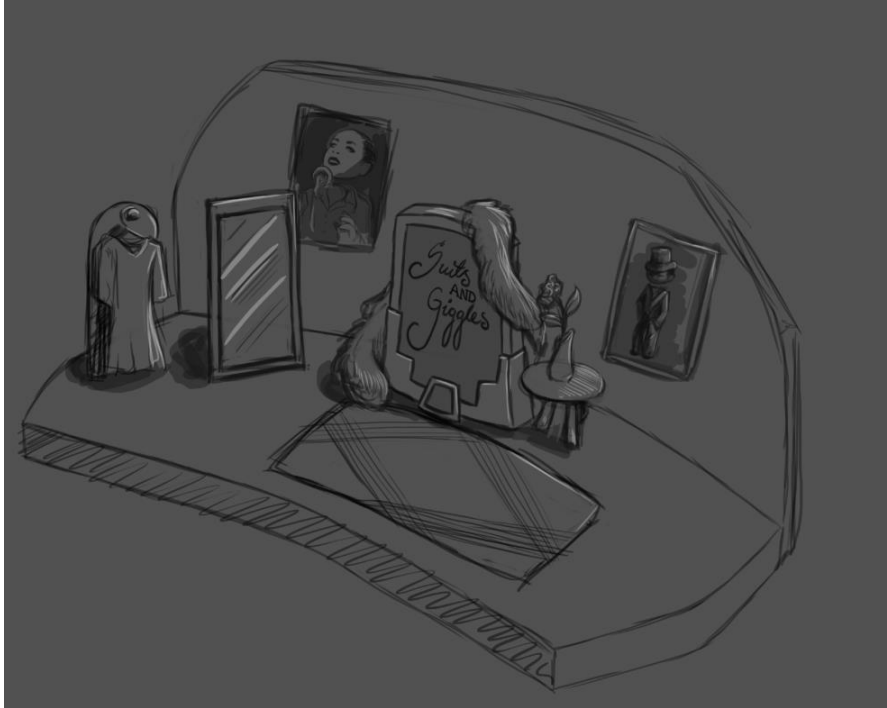


Figure 10. Initial sketch for the clothing shop



Figure 11 Finished shop area.

4.3 Modeling a Game Environment

However ambitious I would like to be with my room design, the limitations of the final platform force me to lessen my ambitions a little. It is a common occurrence that the ideas of artists and coders clash, when it comes to modelling game assets. The technology sets limits on texture sizes and vertex budgets.

While modelling, I like to make instances of objects, so there will always be an object with scales and rotations as default. It is so much easier to do changes on element level, not having to worry about whether rotations and coordinates are in global or local modes. Symmetry modifiers also work best when rotations are 0. With symmetry, it also helps if modified object's location is origin, so that the pivot point is the location for the mirror, thus also the origin.

When discussing budgets and file sizes people often use the word, polycount, which refers to the number of polygons in a model. However, when making a game model, the quantity of vertices is more important, than the number of polygons.

Most of the objects in Project X use only one smoothing group, as per recommendations of the project's technical artist. Multiple smoothing groups are advised only, if really necessary. Polygons are recommended to have a maximum of four sides, meaning modelling should be done mostly with quads or triangles. Game graphics tend to consist solely of triangles, so models should be triangulated before taking them to the game engine. Unity divides polygons into triangles automatically, so triangulating beforehand is not always necessary. However, the end amount of vertices can be decreased substantially by manually triangulating meshes.

Uniform smoothing tends to make objects look formless and marshmallow-like. The illusion of hard edges can be created with emulating sharp shadows with vertex colour, or unwrapping the object so, that there will be a seam in the light map on the desired edge.

Because the resolution of textures and light maps will be small, unwrapping should be done so, that there is enough space around each UV-island. That may seem like a waste to leave so much empty space in the UV-map, but with such small bitmap resolutions, having the isles too close together will cause them to bleed into each other. The space is especially important between islands that will have a large contrast in colour or shadow.

Diagonal seams on an UV-map should be avoided whenever possible. In my case, most models in the scene consist of flat surfaces with four corners. Those kind of objects are easy to lay out on the map with straight vertical and horizontal lines. With bigger textures the position of UV-islands would not matter that much, but in small resolutions every pixel becomes visible, and diagonal pixels look messy.

Textures use a lot of memory, so they should be kept small and scarce. A good way to minimize texture loading is to make textures and materials that can be used on several objects. In some cases, vertex colours can be used in place of textures. Vertex colours are especially useful in objects, where colouring is simplistic, and the colour areas can be created with geometry. Textures should be used only when vertex colouring would be insufficient, such as the tiling wall and floor patterns and paintings.

To minimize the amount of materials in the scene, all textures within a single material can be assembled in one texture atlas. Keeping the textures in one place makes loading the textures faster, and it enables one material to use several textures. This way, having

multiple almost identical materials can be avoided. Unity has a tool for automatically assembling user interface graphics, but for textures a similar tool needs to be coded.

The size of the atlas is determined by the size and amount of textures. For good optimization, large and important areas should be bigger in the atlas, than the small and less visible ones. If the shape of an object's UV-isles makes it difficult to fully use a square shaped texture area, multiple objects using the same texture can be unwrapped simultaneously to fill the area better. For example, I compiled all the paintings in the room to a single texture, which enabled all the paintings to share a single material.

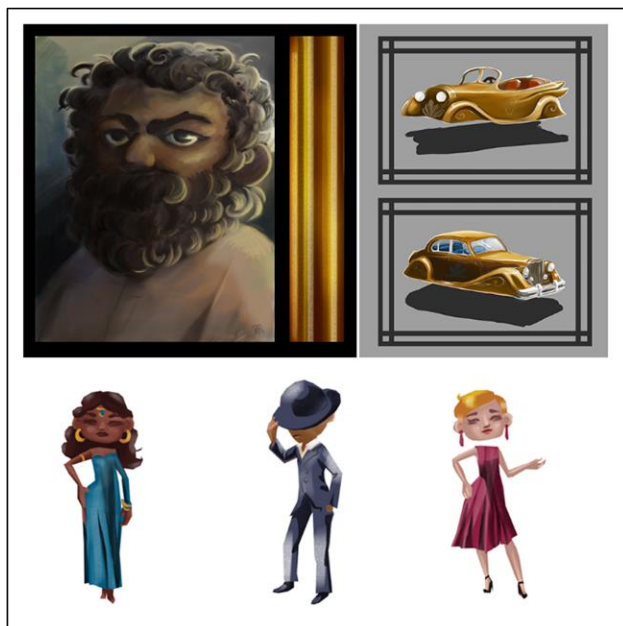


Figure 12. The bitmap texture for paintings

In case Cigar Lounge, I used textures on the curtains, because that seemed to be the best way to make folds for the curtains. I could have made the folds with geometry or vertex colour, but both of those options would have required an unreasonable amount of extra vertices. Thus, I deemed textures in this case to be the lesser evil. I could have also used a normal or bump map for the folds, but since the art style in Project X is not even remotely realistic, there's really no use having extra texture layers that would just hog memory and add to render time.

Geometry can only do so much when building an atmosphere. The value of light when creating a space is often underestimated. Lighting plays a big part in creating an atmosphere, and lights are a very important factor in establishing a path for the player. Lighted areas are more attractive to the player, than plain grey or dark areas.

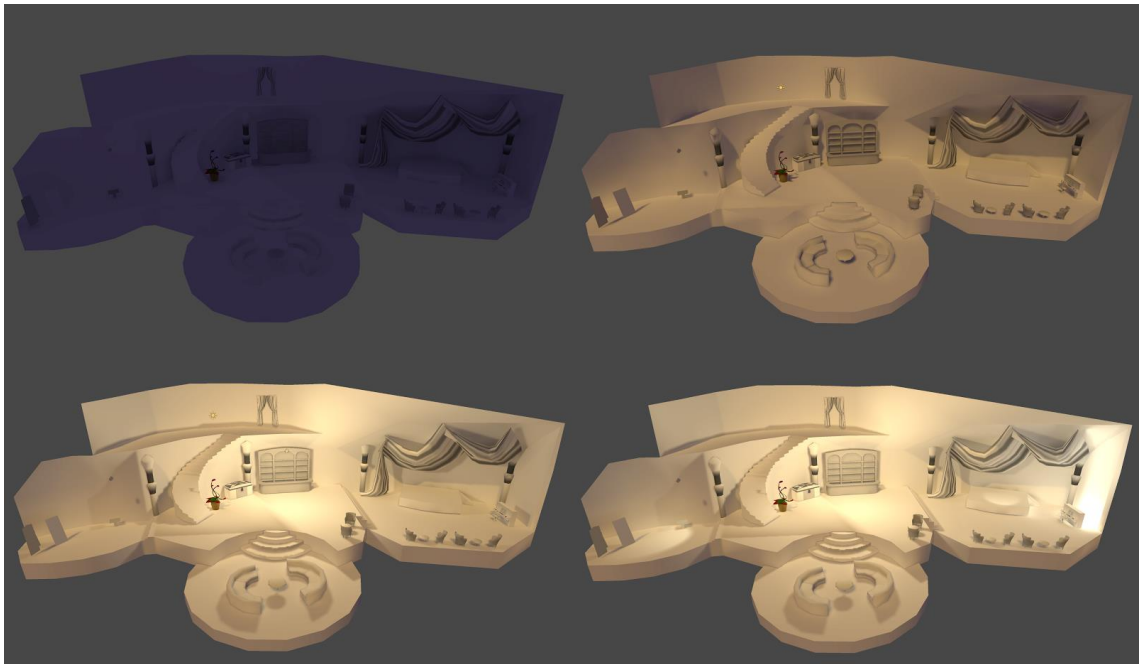


Figure 13. Building Lights

Lights are best assigned for white, untextured objects. The subtle differences in the amount and colour of light and shadow are easiest to detect on a white surface. When building lights, it's best to start with the biggest light sources, then gradually add smaller ones. Using photographs for colour and lighting reference helps.

In the first picture the only light source is the skybox. Source for ambient is a solid colour, in this case a desaturated purple. Other good colours would be blues and greens. For a warmer and lighter colour scheme one could also use the brown spectrum. This sets the colour of the shadow. It is important that the ambient colour is not too dark, otherwise the contrasts become too dramatic and very uncomfortable.

The second image has one directional light, which is the main light source for the scene. The function of this light is to cover the whole scene and to establish the overall light temperature. The colour of this light is set to a light brown to give the impression of warm, artificial indoor light. This light being the biggest light and acting as an ambient, will not need a visible source, such as a lamp. It can exist by itself.

The third image already has some large point lights. The biggest light of all is set in the very centre of the scene. It will later be emphasized with a chandelier mesh. Point lights in Unity are lights where the light emanates without direction from a certain point in space. They are good for lighting large areas realistically. The light is brightest closest to

the source, and gradually fades, the further it reaches. The colour of this light is set to a warm yellow.

In the fourth image, I have added the smaller lights to make the place livelier, and to draw attention to certain areas. Points of interest are marked by spotlights, and the social spots, such as sitting arrangements, have small point lights set in the middle. I also added a white area light in the place of the window. Having some natural coloured light adds to the atmosphere and creates a contrast between the two different light temperatures.

Real-time lights tend to use a lot of processing power, so it is best to avoid them, whenever possible. In Project X, all lights are baked on to the meshes, using a separate texture layer called a light map. The lights themselves can then be dismissed, as they are no longer needed. Baked lights work just fine in situations where lights are static. If ever in the future we wish to add a day and night cycle, then that would have to be done with real-time lighting.

When the lighting is set, it is time to move on to the materials. It is best to start out by using only a couple of materials in the scene to establish the overall colour scheme, and then add materials as necessary. Paint overs are helpful when trying out colours and details.

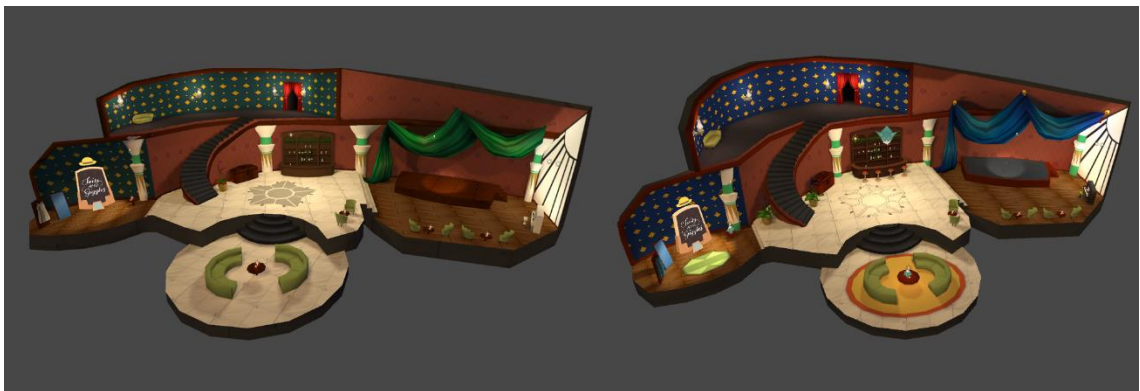


Figure 14. Colour change from green to the final blue.

My initial colour scheme was green and brown, but I quickly realized, that the combination looked bland and flat. After some colour experimenting in Photoshop, I decided that blue works much better. Dark blue looks expensive and luxurious, while light blue is comfortable and welcoming. Wood is a natural material, and as such it is also associated with warmth and homeliness. Dark coloured wood like mahogany or

ebony is relatively expensive, and thus colouring the wooden elements as dark reddish brown makes the room seem super luxurious.

I assembled a chart below to better illustrate the different steps and objectives in the project. The order of these steps may vary and some steps are overlapping. For example, trying out proportions within the engine should be done as soon as possible, paint overs can be done at any stage of the project, and blocking and modelling sometimes happen simultaneously.

Step	Objective
2D sketching	establish overall shape of the area
Mood Concepting	communicating ideas to others, and for helping to keep the desired mood in mind, while designing
Blocking	trying out proportions and paths
Importing models into engine	Testing proportions and camera angles in play
Modelling	creating the finalized elements for building the room
Paint overs	a fast way to try out different things, communicate ideas, bringing mood closer to final, test colour schemes
Lights and materials	final touches to appearance
Active point animations	Add playability to the room

5 Conclusions

Players are an important content in a social virtual world, as they make up the community. The quality of the community is straight up determined by the quality of the players. Richard Bartle's player segmentation seems most useful, when analysing players' behaviour in a virtual world.

In a purely social multiplayer game the most desired segments are the socializers, the achievers and the explorers. The achievers and explorers are defined by their relationship with the game world. The achievers seek to accomplish things and better themselves through gameplay, while the explorer types concentrate in obtaining knowledge. Socializers are the ones hosting events and gathering connections. Killers, Bartle's last group, appear in social games as bullies, and as such, serve no purpose.

According to Bartle, the killers are drawn to the achievers and socializers. The best method to decrease the amount of killers in a social virtual world, is to increase the amount of explorers. This is done by adding explorable areas to the game. Explorers are driven by curiosity and they enjoy uncovering secrets related to the world.

Most game levels can be affiliated with one of the often used design bases. In a game where the most important activity is socializing and wandering around is encouraged, I found the central and radial organizations to be the most fitting.

Intuitive paths are important in game level design, as they help eliminate confusion. The primary path in cigar lounge is formed by locating the stairs near the entry point. The stairs' role as a transition area is obvious, and they invite players further into the room. The different areas within the room are positioned so, that from every area, another area is clearly visible. This gives a sense of continuity to the player.

Architectural rules apply very differently in a game world than in the real world and rule bending is a common occurrence. Appearance and atmosphere are more important in a game environment than functionality. In a game proportion and lighting can be used to make certain objects stand out, which contributes to the path creation.

Contrasts in colour and lighting make areas stand out and seem important. They can be used to attract users to certain areas and spark interest. Contrasts can also be used to deepen some visual aspects. For example, increasing the size of one object will make its surroundings seem smaller, and adding a small, but very bright light somewhere, will make the surrounding atmosphere feel darker.

New players are easily confused and frightened, so keeping entrance areas calm and coherent is important. However, the entrance area also needs to give off an interesting first impression, so people will not turn away at the door. One problem with the library, the room preceding the cigar lounge, was that the entrance area was too large and very dull. The whole room could be seen from the doorway, there were no interesting nooks or hidden corners. People often came to check if anyone was there, and then left, without really entering the room.

The cigar lounge entrance is small, and very plain, besides the stairs and the mysterious portrait on the wall. The portrait, along with the other paintings, will hopefully serve as a conversation starter and an invitation for exploring.

Deadlines are important motivators, and knowing a deadline helps break the project down into smaller workloads. My original deadline was a bit vague, but set somewhere around April-May. Vague deadlines are risky, because they are liable to change. I had planned the project targeting the end of April as a final deadline. However, at the end of February, I had the request of finishing before April. It was a feasible objective, I merely had to speed things up a bit. That also involved some downscaling; I decided I would try to make use of existing models instead of making everything from scratch. I also limited the room's action points to two.

The cigar lounge won't be released until after the publishing of this paper, so the players' reaction to it can at this moment only be speculated. However, the testers seemed to like it, and the final testing session produced a lot of positive feedback. Testers seemed most excited about the stage and singing on the microphone. The divan in one corner also got a surprising amount of attention, as people roleplayed a psychiatric appointment.

During this project I learned a lot about level design, and I would say, that I am now better equipped at observing player behaviour. I gained confidence in presenting my own ideas and accepting critique. I also learned that not everyone can be pleased, and sometimes decisions need to be made regardless of consensus. All in all, the project was a useful experience and fun to do.

6 Sources

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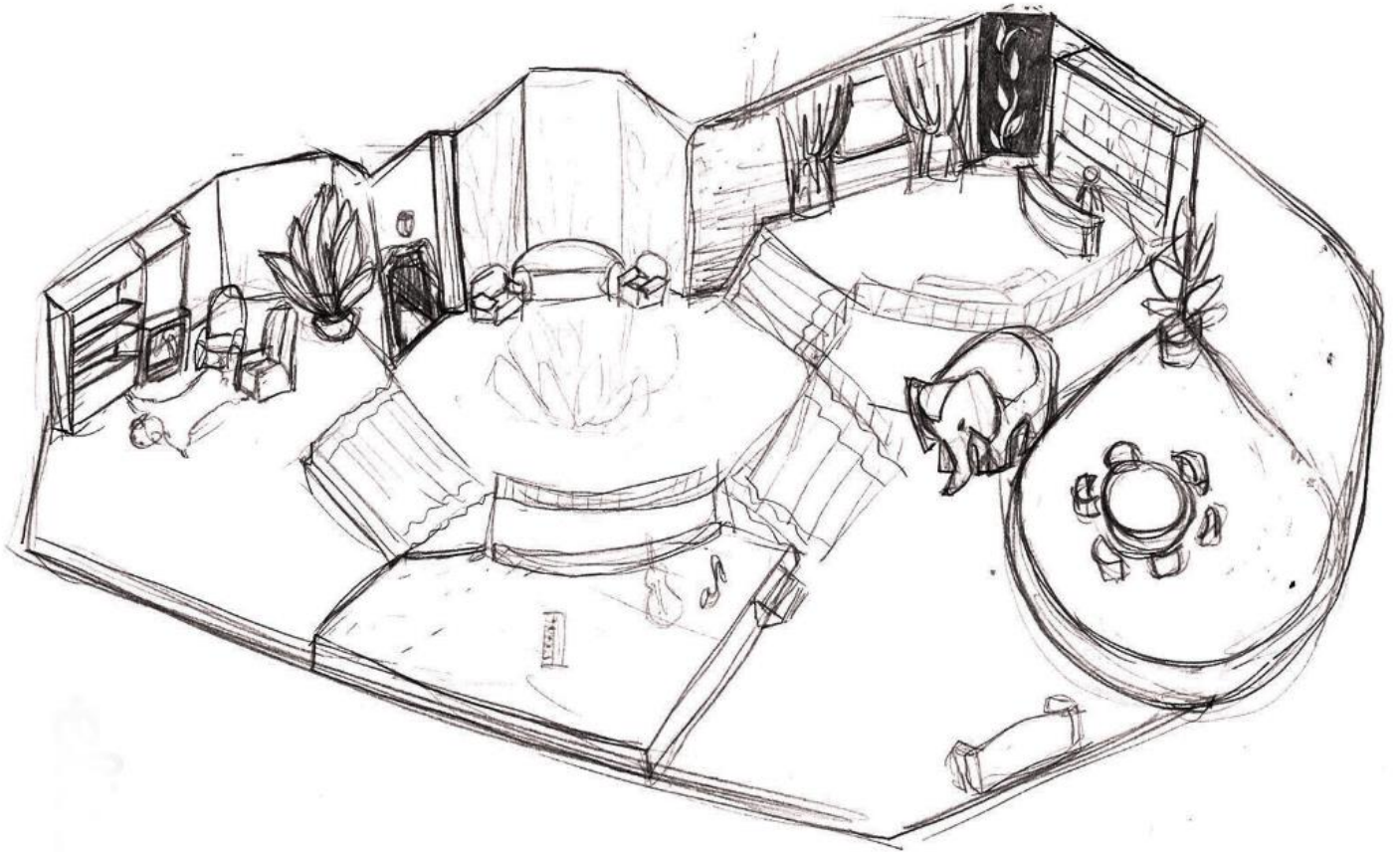
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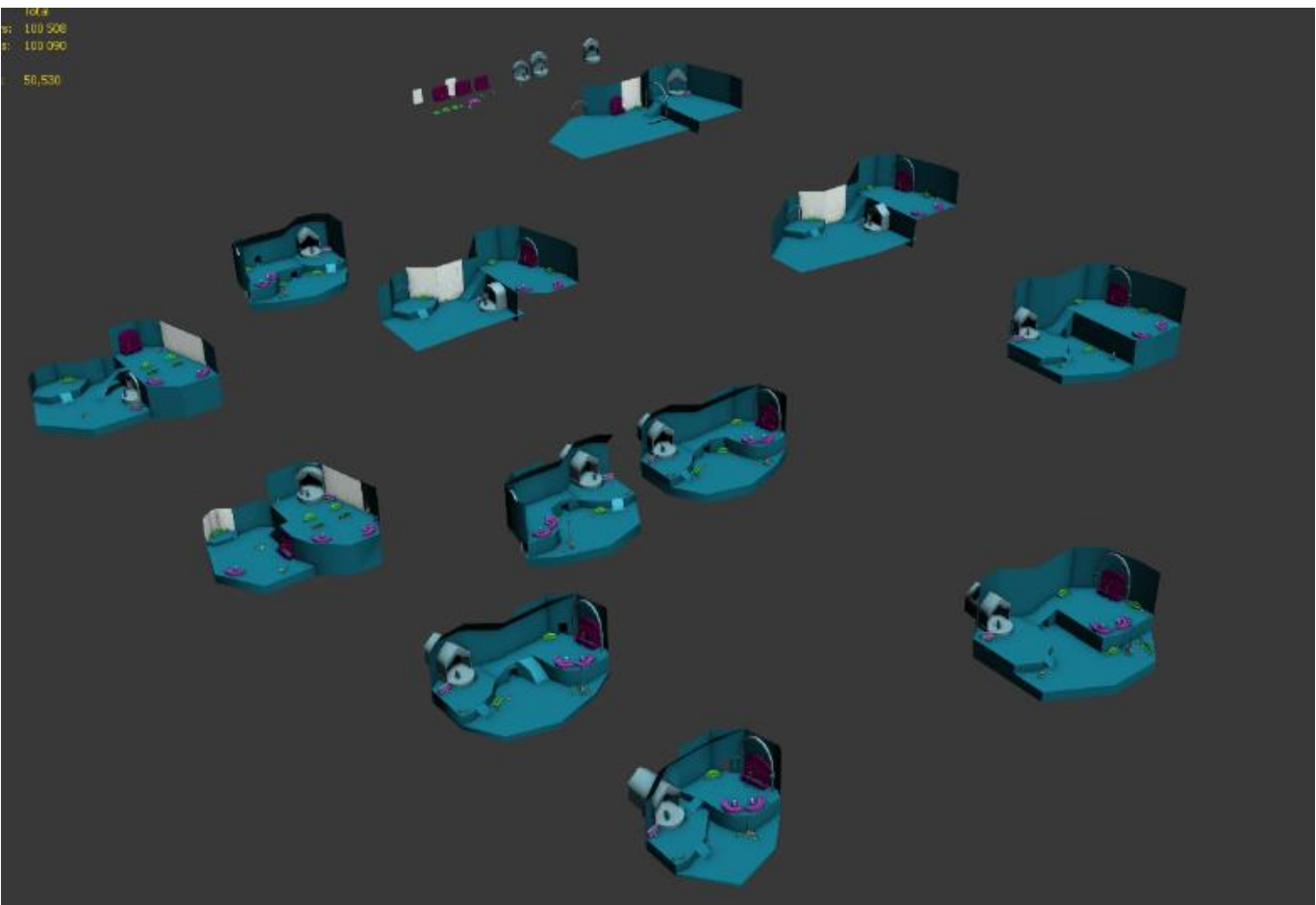
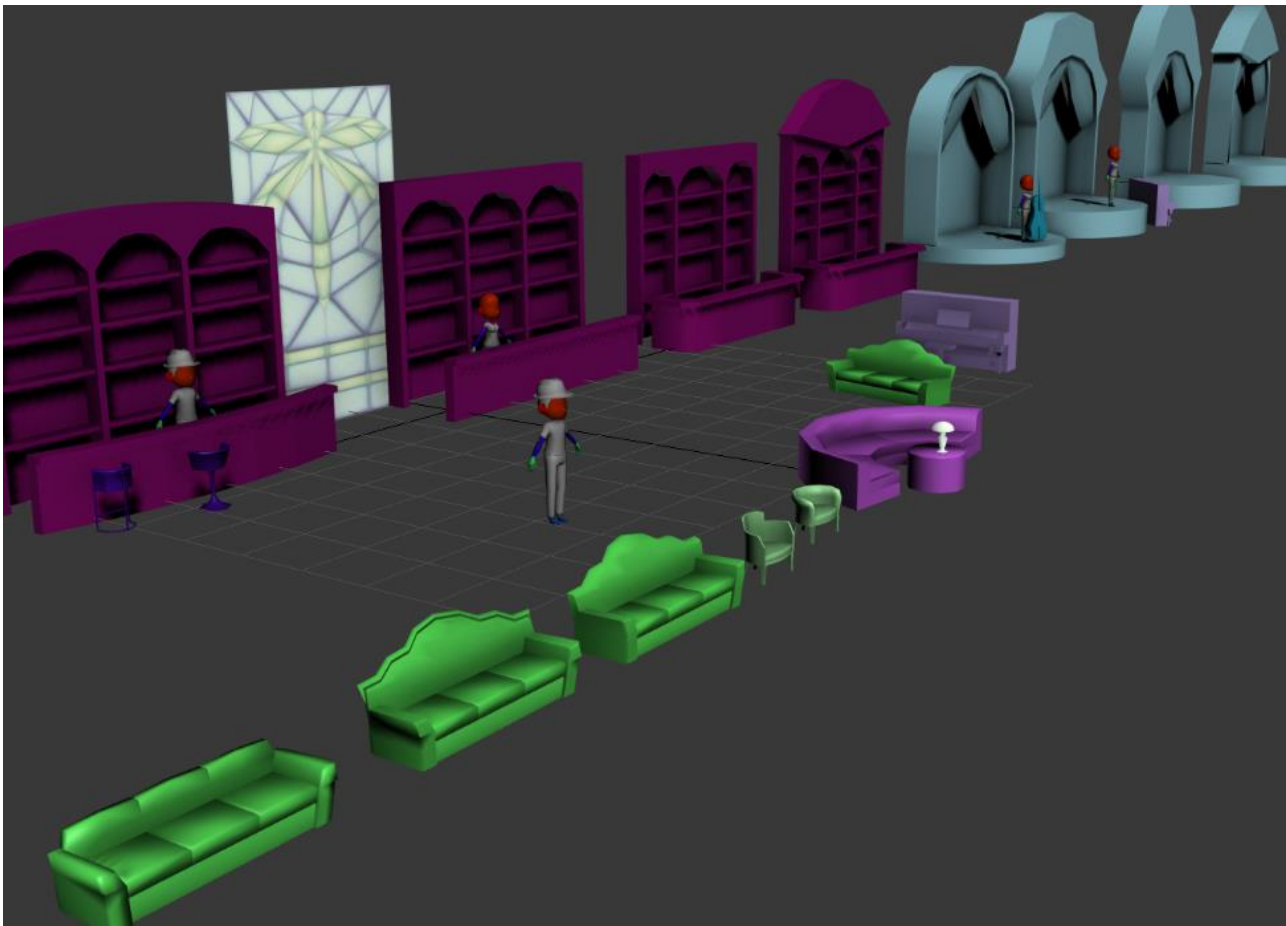
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Appendixes: Process pictures in higher resolution



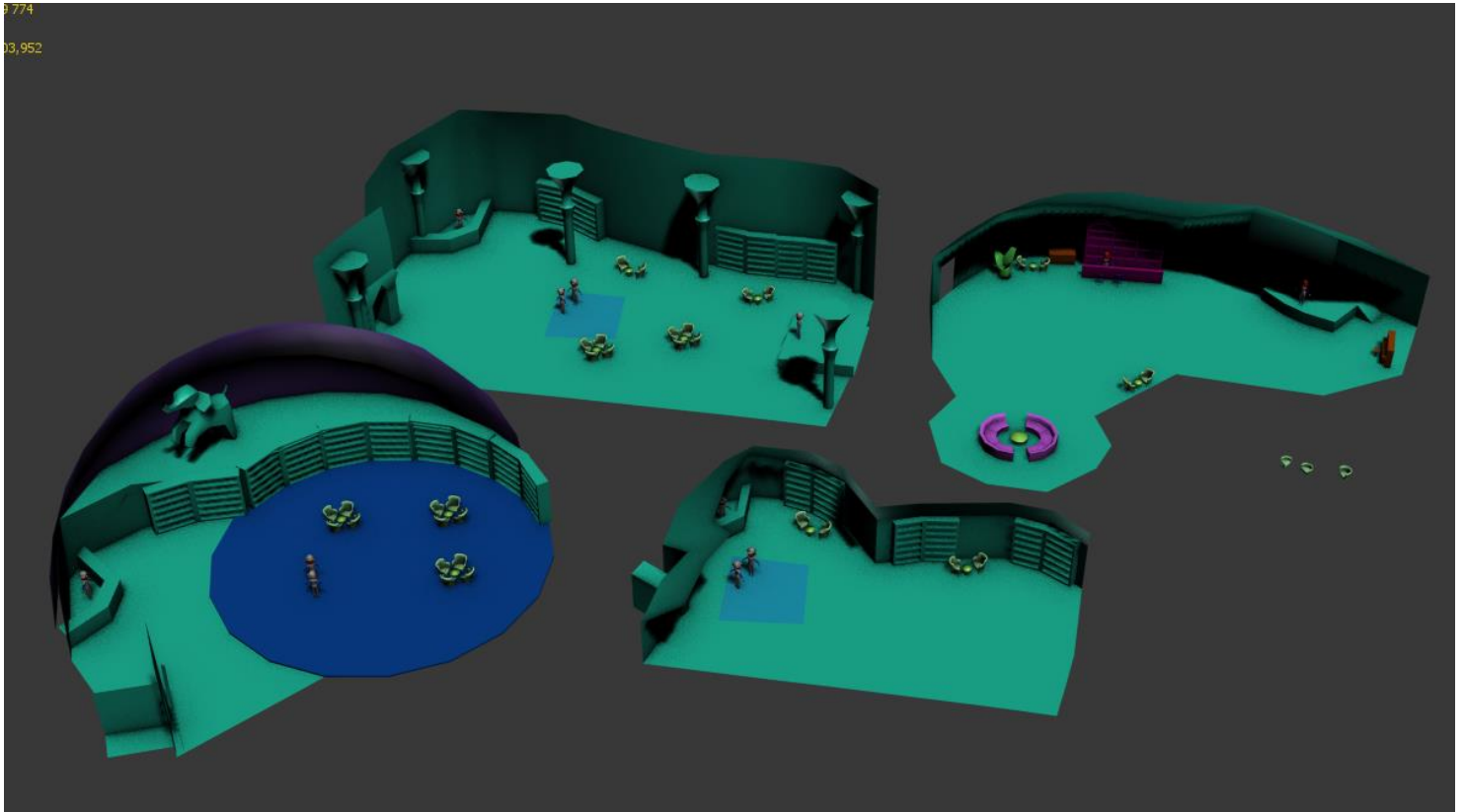
Mood concepts



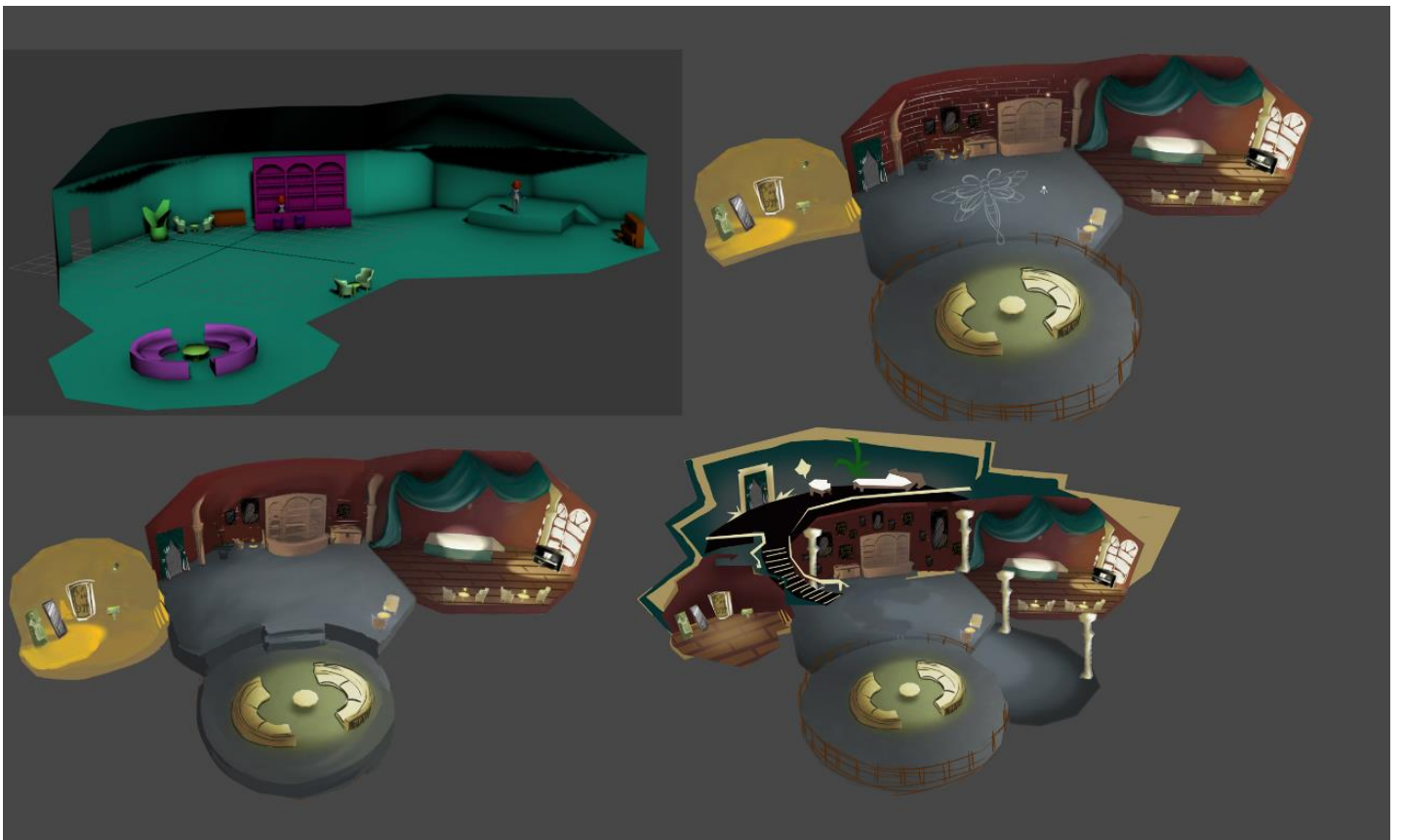
Top: Low detail furniture examples

Bottom: Block out variations made with the furniture examples

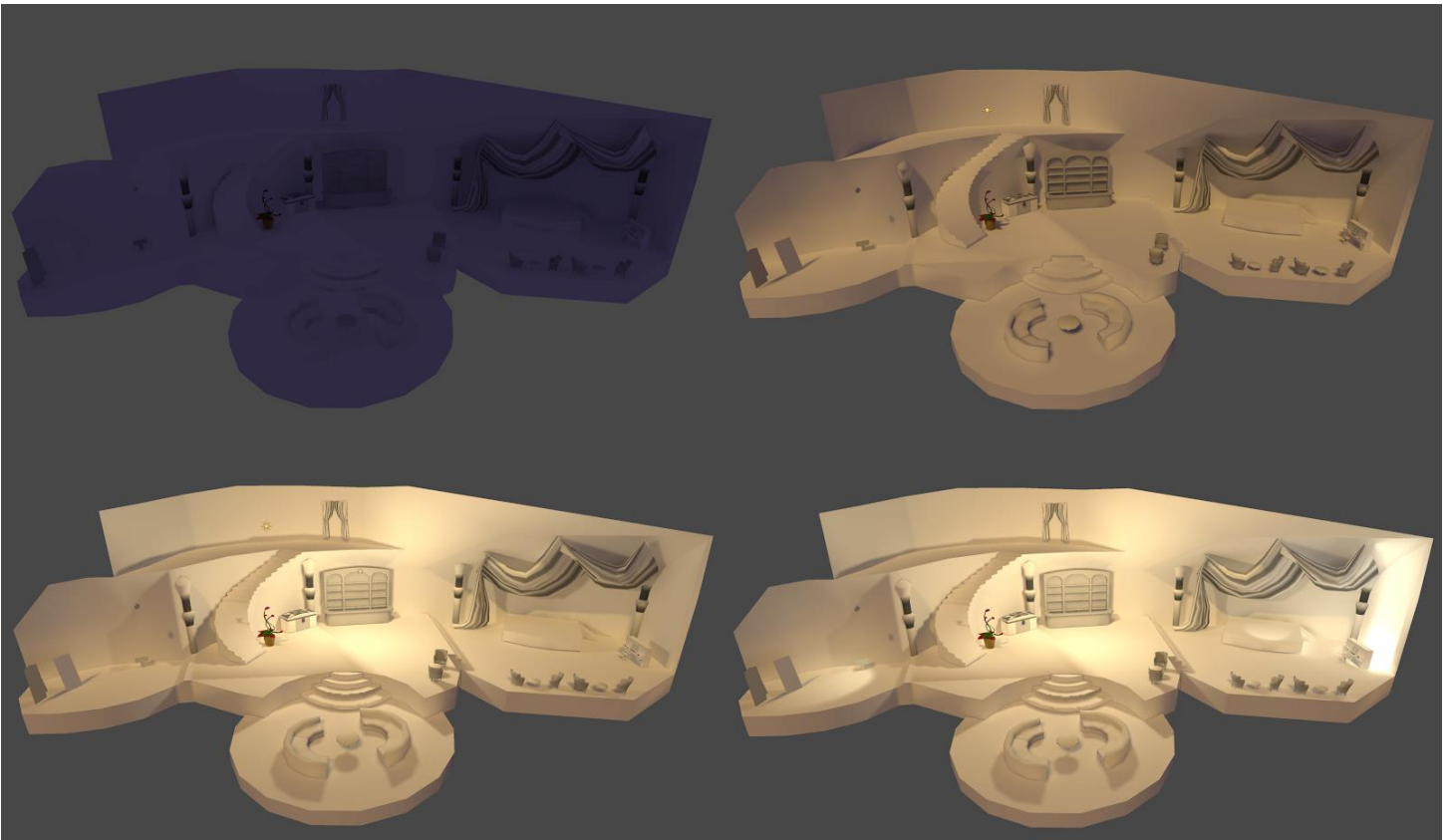
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Different block outs presented as options for general style

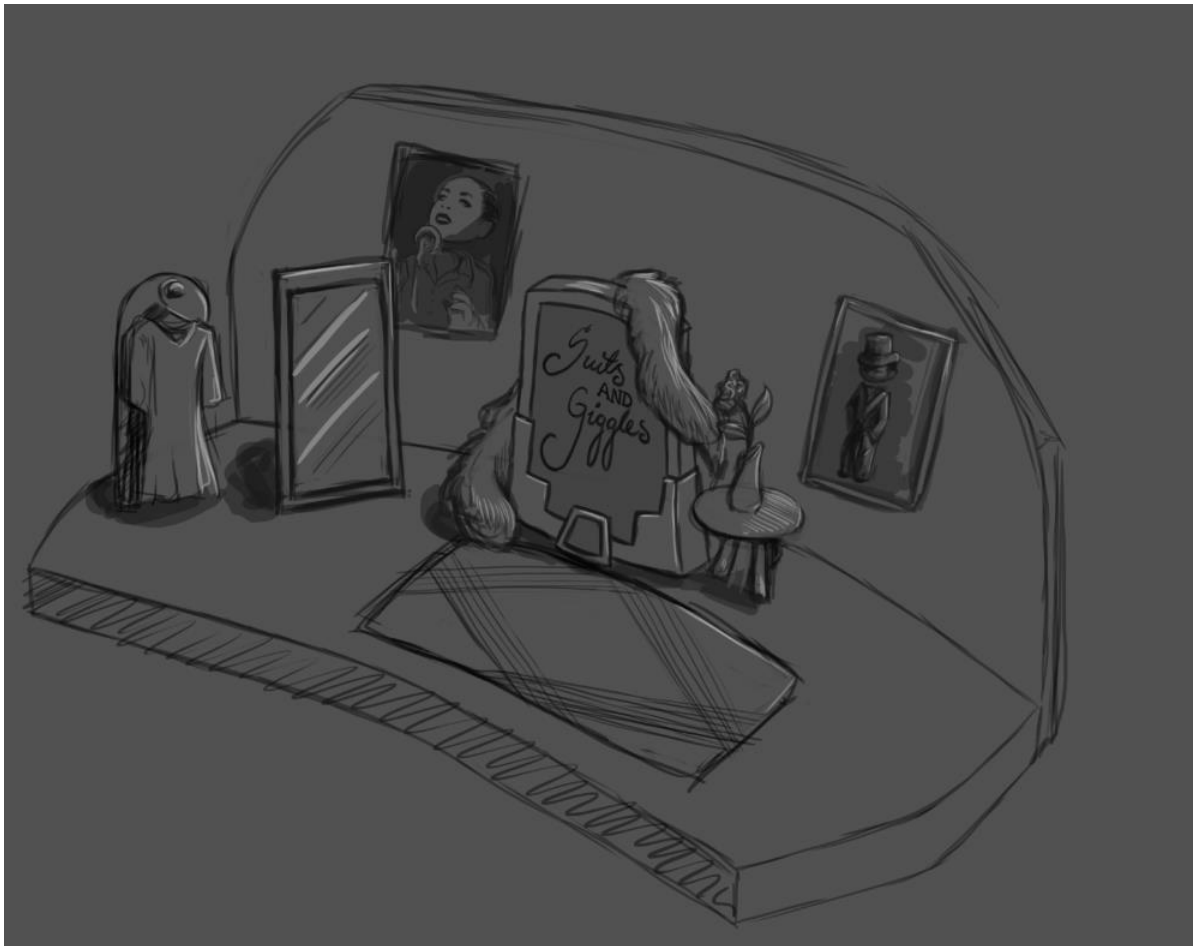


Painted over variations to the final block out



*Top:
Four lighting
phases: ambient
colour, main light
source, secondary
light sources and
spotlights.*

*Left:
Change in colour
scheme. Green
walls and details
looked too flat, so
the colour was
changed to blue.*



Top: concept art for the shop area

Bottom: The final shop area