Virtual Storytelling:

Throught the Use of Architecture

By: Danny Simoski

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WE ARE FINALLY FREE!!!!!!!

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We have had many forms of virtual reality that has changed the way that we interact with each other. Those came in the forms of storytelling, artwork, photography, and lastly, what we now know as "virtual reality" today. What was once just science fiction is now being actualized thanks to our rapid advancements in technology. With these rapid advancements comes new ways of making our lives easier or creating a new way of living all together. The virtual world is one that is yet in its infant stages but is rapidly evolving into somewhat of a titan. This virtual world, and everyones fascination with it, is what pushed this thesis and the exploration of a boundless world and what we can do with it.

The question that was imposed was virtual storytelling and how architecture can play an important role within that environment. These ideas can be broken down into two simple concepts that make one complex whole; Storytelling and the virtual world. The first few initial steps were to look into the virtual world and how the video game industry can create these functioning and beautiful worlds. They begin to straddle this fine line of imagination and the use of technology to create a wonderful storytelling component.

Our first steps lead to the mechanics of how a virtual world works and the technology that has brought us up to this point in time. This topic on its own, is one that would take years to explain and the focus would lead down a rabbit hole of various technologies. We will be focusing on just the details we need in order to properly explain the research.

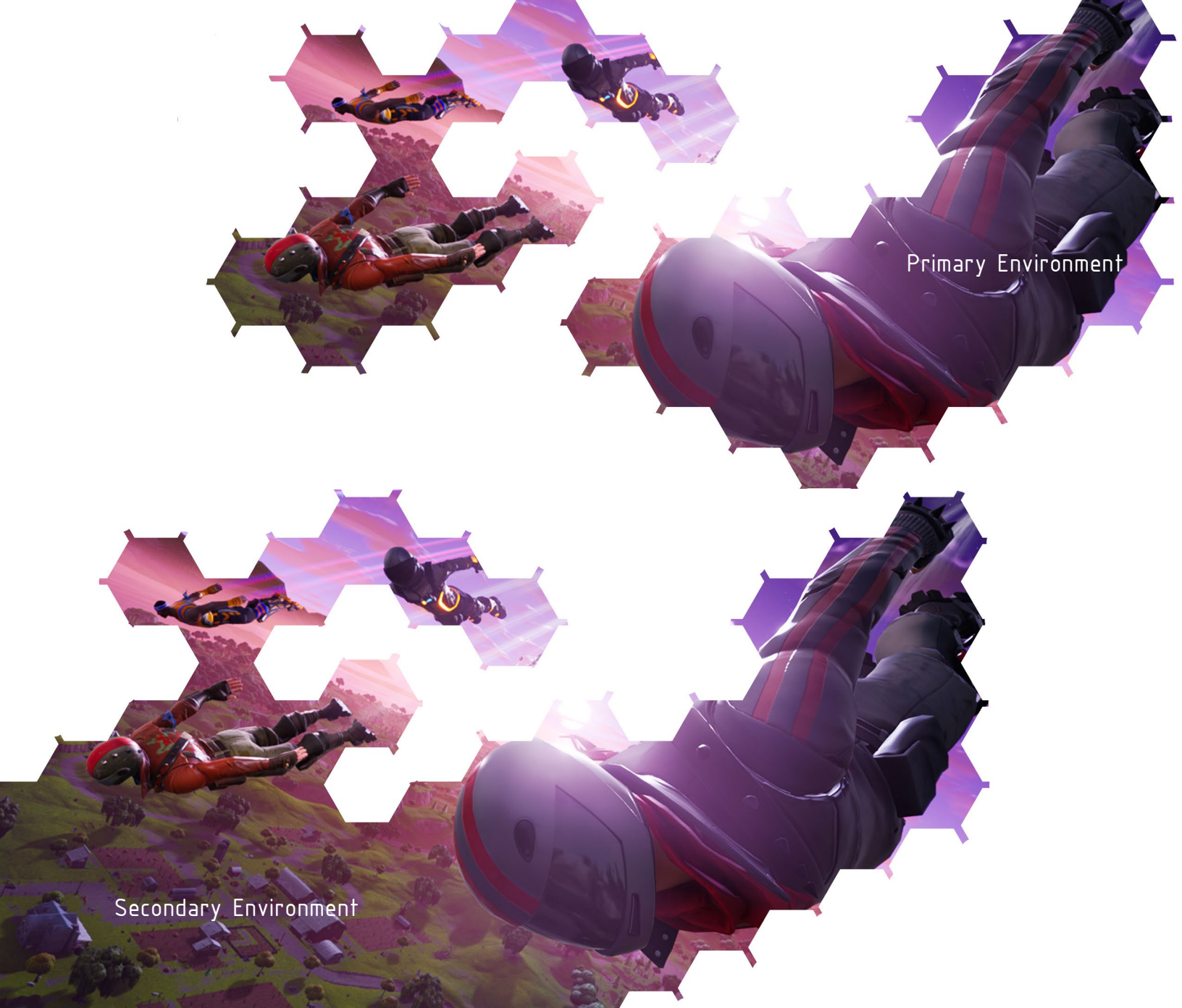
The first sketch problem was a necessary step in order to identify the problem at hand. This allowed for a deeper look and understanding of social environments within the virtual and physical world. This allowed for a breakdown of both environments into four distinct groupings being:

Primary Environment
Secondary Environment
Tertiary Environment
Quaternary Environment

Assassin Creed by Olivier Martin


Primary Environment


Secondary Environment


Primary Environment
Secondary Environment


Tertiary Environment


Tertiary Environment
Fortnite, Epic Games


TRUMP
TRUMP
TRUMP


Quaternary Environment

Before delving deeper into our sketch problem, we must first engage with the conversation of this "avatar." This avatar is essentially your way of interacting with the virtual world and the other avatars present. We have a multitude of way we can move our avatar in this virtual space which can be, mouse and keyboard, remote controller, or VR (virtual reality) headset. In most instances, these avatars can be customized in order to represent your own real world appearance or something that is unrecognizable. Now that we have a basic understanding of the avatar, we can see their impact on the virtual environment.

Our primary environment in the physical world is that which we can immediately interact with. Within our example, Central Park, we can see that our initial interaction can be made with the people around us and the ice rink that encloses us together. It is this creation of the ice rink that allows us to interact with each other and become sociable. Within the virtual world of Fortnite, we have very similar conclusions to make. One of the main differences is the way we move into our primary environment. In the virtual world, we essentially pop up in that designated environment compared to us moving from place to place within the physical world. Another difference that comes to mind is our avatars ability to manipulate the primary environment much more drastically than what we are allowed to do in the physical world.

The secondary environment, in our physical world, is the area surrounding the ice rink. It is the trees that are located beyond the boundary of the ice rink. These are the environments that require you to move from your primary environment in order for you to interact with them. Once you move from the ice rink to the trees in the park, you move from one primary environment to the next. Essentially, the park is your new primary environment and the ice rink is now your secondary environment. This concept is essentially the same for the virtual world and how the avatars move through them.

As we move farther into our environments stages, we move into our tertiary environment. With our example of Central Park, we can see the buildings that are beyond the boundaries of the park. These are what we can consider as the tertiary environment. They are the spaces that lie beyond

what we can interact with and take a considerable amount of time to get to compared to our close relationship between primary and secondary environments. In Fortnite, these environments are represented by the different areas that are not immediately visible to the view of our avatar.

Lastly, our quaternary environment is that which essentially impossible for us to interact with. Our physical world example would be the sky. You can make a comparison by saying that this is the background in which our other three environments lie. This environment is also where we begin to differ in our virtual world. In Fortnite, we do have the similarity with the sky as a background but we also have these spaces which you can see but never able to travel to. In this example, it would be the mountain ranges that are located beyond the realm where our avatar is able to travel to. The only purpose of these environments is just an aesthetic appeal. Instead of white/black space, we fill these spaces in order to give a more immersive feeling to a virtual world.

In essence, we can conclude that these two worlds are not as far apart than one might actually think. It is with this realization that we can make a plausible case for the need of architects in the virtual world. They may have different needs that may impact the approach an architect might have when designing for either world. An interesting idea that came to mind is how an architect has free reign to do whatever their imagination can create without the limiting factors of the real world such as physics or budget.

Workflow

Further exploring the viability of an architect as a storyteller in the virtual world, is the workflow that both architect and environmental designers exhibit. It is this examination that we being to see a few differences that may need the architect to adapt to in order for them to create a successful virtual storytelling design. We will be looking into the workflow of environment artist Martin Teichmann as the base standard of virtual world design. Teichmann goes in depth with the process he used in order to create one of Naughty Dogs most successful franchises, Uncharted 4: A Thief's End. The workflow stages that have been defined are:

Concept Sketch
Mass Modeling
Refined Modeling
Overpaint | Construction Documents
Readability and Playability | Construction
Finished Design

Concept Sketches are the first step in every design oriented work. This is where we begin to lay out ideas in order to create something that is aesthetically pleasing to not only the client,

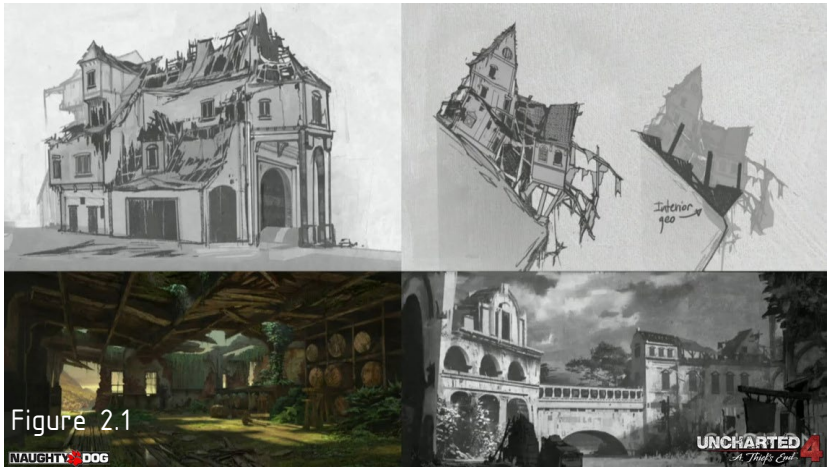


Figure 2.1


Figure 2.2
Guggenheim Sketch, Frank Gehry

but the users of finished product. The Concept that Teichmann was tasked with, was the creation of a lost city in a state of ruin. The final concept that his team landed on was that of a pirate utopia (Figure 2.1). These initial sketches allowed Teichmann to being to understand what the final product was going to look like. He doesn't explain how many sketches they came up with before finally landing on the pirate city. These concept sketches are very similar to how Frank Gehry came up with his ideas for how the Guggenheim Museum Bilbao was to be represented. With these initial sketches (Figure 2.2), we can see Gehry's image of a ship floating along to shore of the Nervion River.

The next step within the designer workflow is the mass modeling. After Teichmann was pleased with the direction of the concept sketches and the representation of the pirate city, he instructs his level designers to create a block mesh (Figure 2.4) of the city to see how it will sit within this mountainous environment. In this state, the game is essentially playable but isn't quite there aesthetically and is in need of Teichmann's expertise. The same can be done with the Guggenheim. They begin to create a mass model within the selected 3d modeling program in order to see the actual scope of the project and how it will begin to look along the river. These are crucial in order to

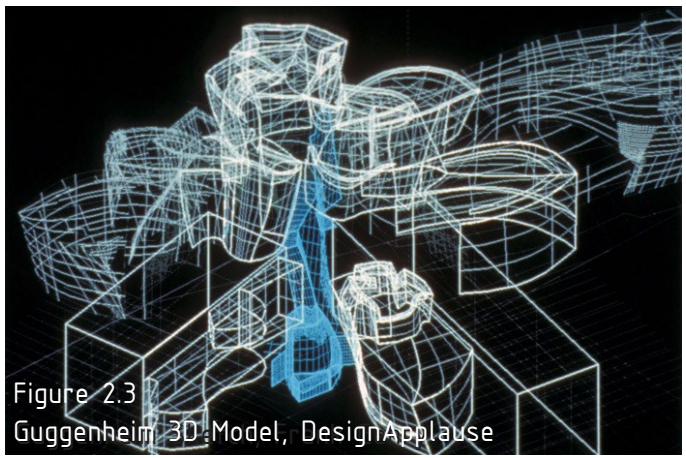


Figure 2.3
Guggenheim 3D Model, DesignApplause

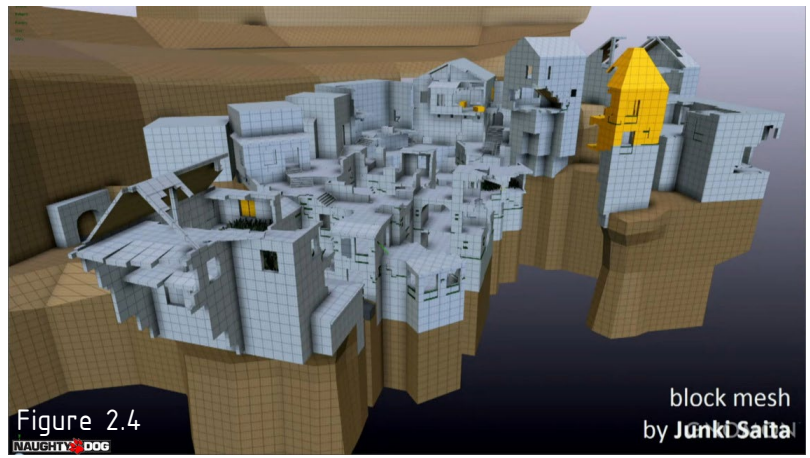


Figure 2.4

identify and sort any problems that may arise later on in the process but can be avoid in this phase.

Refined mass models are the next steps in the workflow process and begin to define the elements that will make it to the final design product. For the virtual world, this means the addition of gameplay elements that allow the avatar to use the environment in a way the game was intended. One way that Teichmann describes this phase as fine tuning. "If I submit a new building and the collision mesh is missing, the player falls through the level, so I get a call from the design team!"

it is after this hidden mesh is complete that they can add the visual elements (Figure 2.5) that allow for that aesthetic appeal. Refined massing is somewhat similar in the architecture workflow but is more of a finalization of the exterior shell. The model shown (Figure 2.6) for the Guggenheim gives us a sense of how the final product will look like but at a smaller scale.

Overpaint is the next leap in the virtual world which is essentially the masking of the working elements. Think of this as the designing of the skin that hides the structural elements of a building (Figure 2.7). These are where the finer

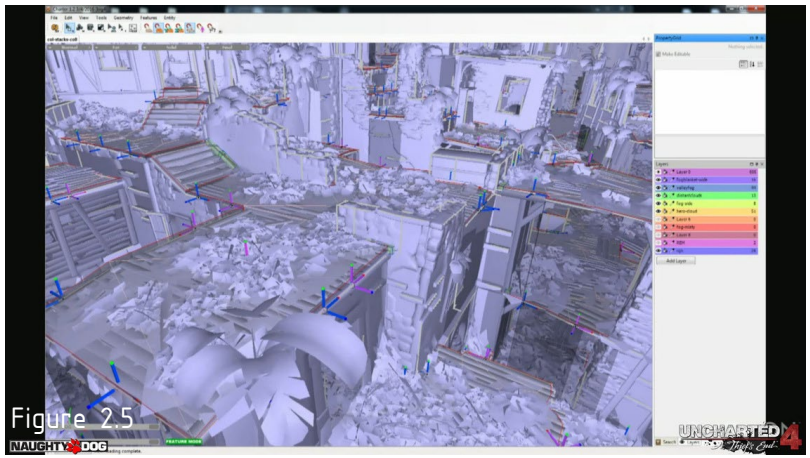


Figure 2.5

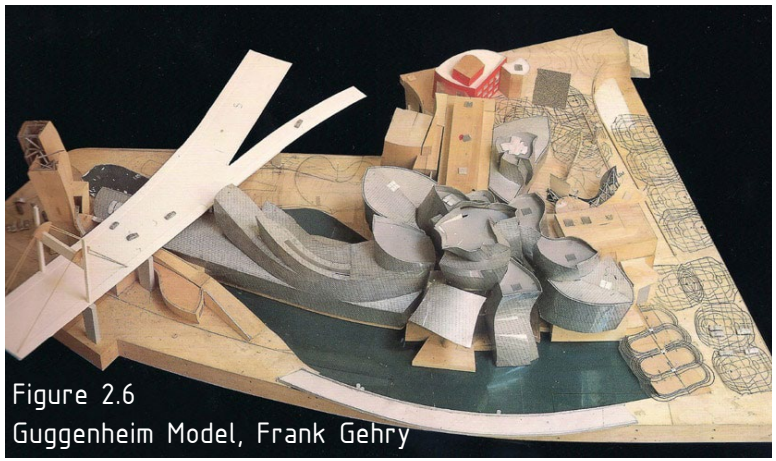


Figure 2.6
Guggenheim Model, Frank Gehry

details like foliage and materials of the buildings are added to mask the "structure" in a sense. You begin to understand that this place used to be a pirate utopia that is now beginning to collapse down the mountainside. This is where we begin to see the workflow change in architects and environmental designers of the virtual world. This is where the architect begins to document more of the construction process (Figure 2.8) of the Guggenheim. We can see that the order is somewhat different where environmental designers refined the structural elements in the previous step of the workflow process and added the skin after it was created. The role is reversed for an architect, as they look at the skins design before the structural elements.

One of the most important aspects of a virtual design is the playability (Figure 2.9). One can have one of the most intricate designs that can leave anyone in awe but if it doesn't work, it is useless. Teichmann put it bluntly by stating "The problem was that all the gameplay mechanics – all of the jumping, and ledge grabs, and cover – still needed to work." This is the fine line that virtual world encounters when it comes to an environment looking appealing and how it functions as avatars begin to inhabit it. The closest comparison that

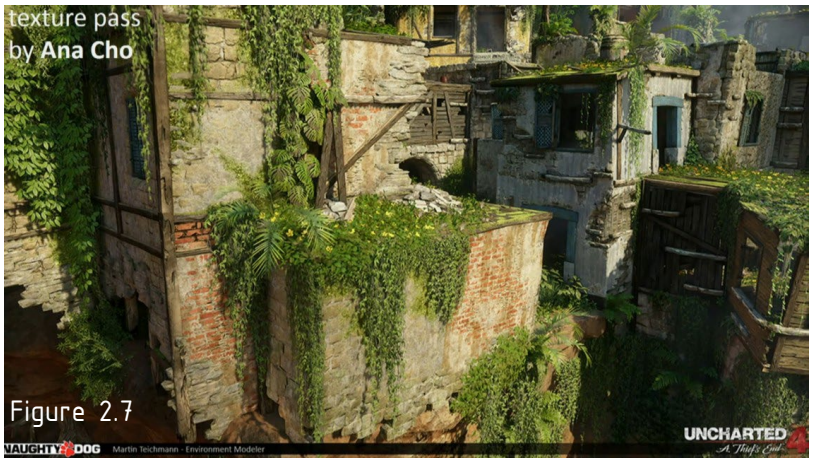
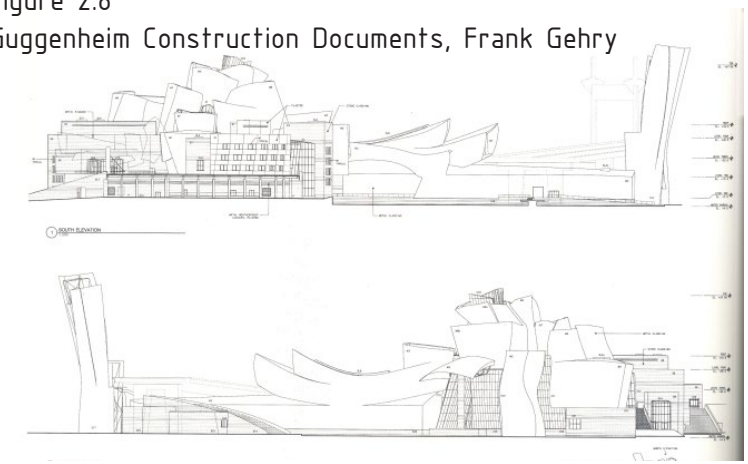


Figure 2.7

Figure 2.8
Guggenheim Construction Documents, Frank Gehry

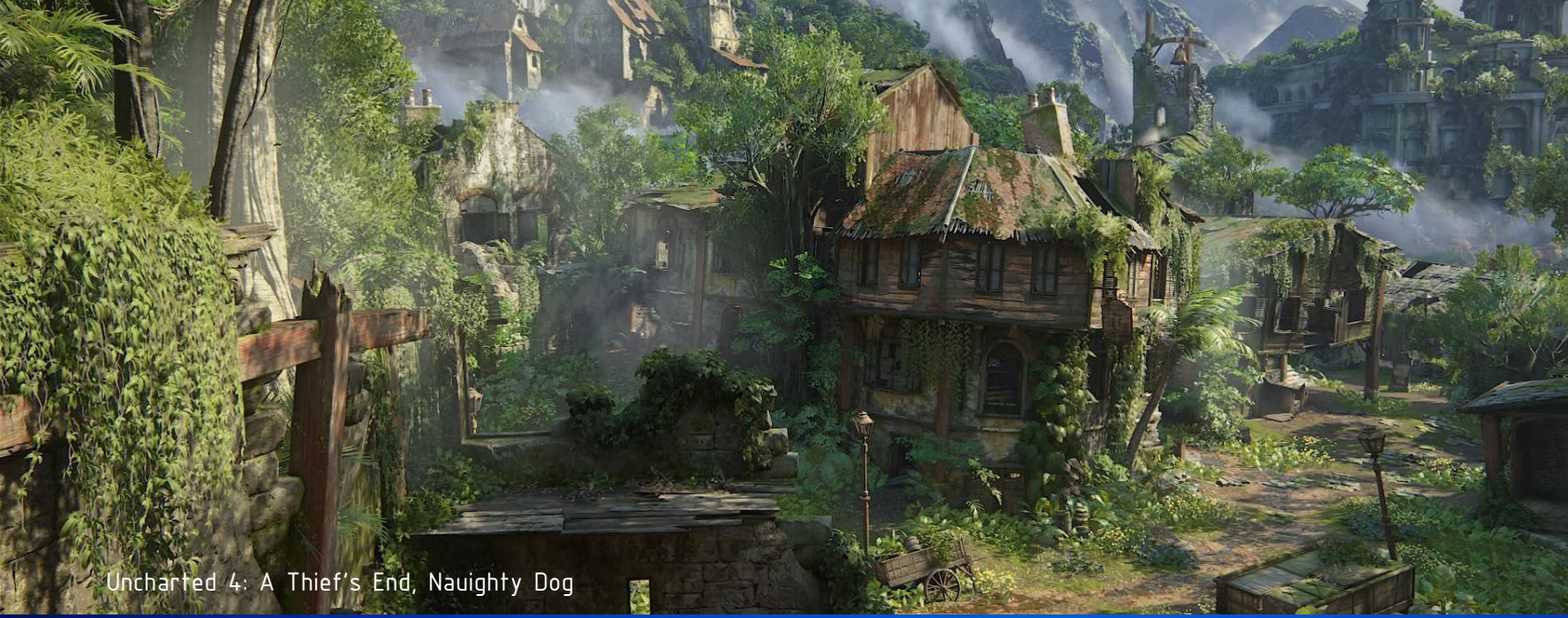


one might relate to in the architects workflow is construction. (Figure 2.10) This is where we begin to see the final product come to life. This is also where some design ideas may conflict with the overall function of the structural elements that need to be built. If we have some sort of conflict between the two elements, we need to remedy the problem as quickly as possible.

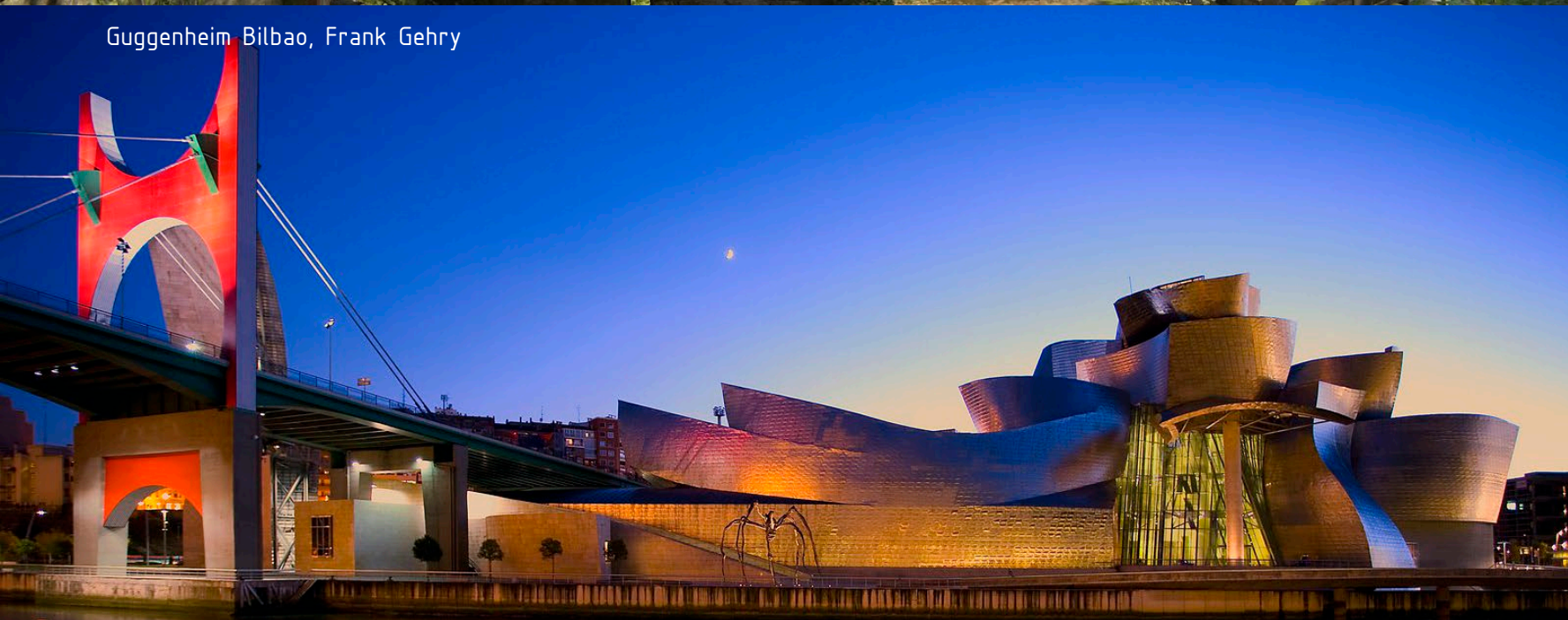
What both professions end up with is an amazing product that both look beautiful and function structurally. They both have to take into consideration certain elements that may limit what they can do; gameplay butting heads with design of the environment and structure limiting the design of the façade.

Figure 2.9


Figure 2.10
Guggenheim Construction, Frank Gehry



Uncharted 4: A Thief's End, Nauighty Dog



Guggenheim Bilbao, Frank Gehry

History of VR

The history of virtual reality has most of it greatest advancements in the 21st century but we cannot ignore all of the other technology jumps in the 1900s, and earlier, that have led up to this point in time. From the first ever VR experience that came about in mid 1800s, its defining name in 1985, to the very first Oculus Rift prototype in 2010. These are all important dates that have paved the way for the virtual world and the way we experience it.

Taking a look at the initial concepts for VR (virtual reality) and AR (augmented reality), we get this sense of wanting to create another world within the one we already inhabit. Ivan Sutherland, which we will talk about later, had a grand vision of what he wanted VR and AR to accomplish. "The goal of augmented reality is to create a system in which the user cannot tell the difference between the real world and virtual augmentation of it."

The first ever augmented reality device was invented by a man named Charles Wheaton back in 1838. His invention brought us the very first stereoscope (Figure 3.1). It allowed for the placement of two similar images, one for the left eye and one for the right eye, which when combined would create a single 3D image. Our next augmented experience didn't come until 1962 when Morton Heilig developed the Sensorama (Figure 3.2) which used our five senses to allow for an all immersive experience. This was seen as one of the first 4D experiences that would rival no other at the time would vibrate and release odors for the user to experience.

Figure 3.1
Smithsonian Magazine

Figure 3.2
Sensorama – AVADirect

Computer scientists Ivan Sutherland and David Evans were the first to create a head mounted display back in 1963. They nicknamed their HMD the Sword of Damocles (Figure 3.3) which allowed the users to interact with objects in the real world but see a completely different object in the goggles. The computer hardware was so advanced at the time that it gave them the ability to form virtual worlds and keep them functioning in real-time. Sutherlands described his end goal for VR "The ultimate display would of course, be a room within which the computer can control the existence of matter. A chair displayed in such a room would be good enough to sit in. Handcuffs displayed in such a room would be confining, and a bullet displayed in such a room would be fatal. With appropriate programming, such a display could literally be the wonderland into which Alice walked." Sutherland was one of the very first visionaries of VR and its capabilities.

Figure 3.3
Sword of Damocles – Ivan Sutherland

Our first simulation came in 1966. Thomas Furness created the first flight simulator for the Air Force. This allowed for great leaps in VR technology thanks to military funding. In 1969, Myron Krueger, a computer artist, developed one of the first "artificial reality" experiences using computers and video systems. This system allowed for a computer-generated environment that responded to the users in it. Krueger later expanded on that idea and created VIDEOPLACE (Figure 3.4) in 1975. First interactive VR platform, displayed in Milwaukee Art Center, used computer graphics, projectors, video cameras, video displays and position sensing technology. The users had a computer-generated silhouette imitate their own movements and actions on the screen. Users in other rooms could interact with other silhouettes in the same virtual world. This encouraged the idea that people can communicate with each other in the virtual world.

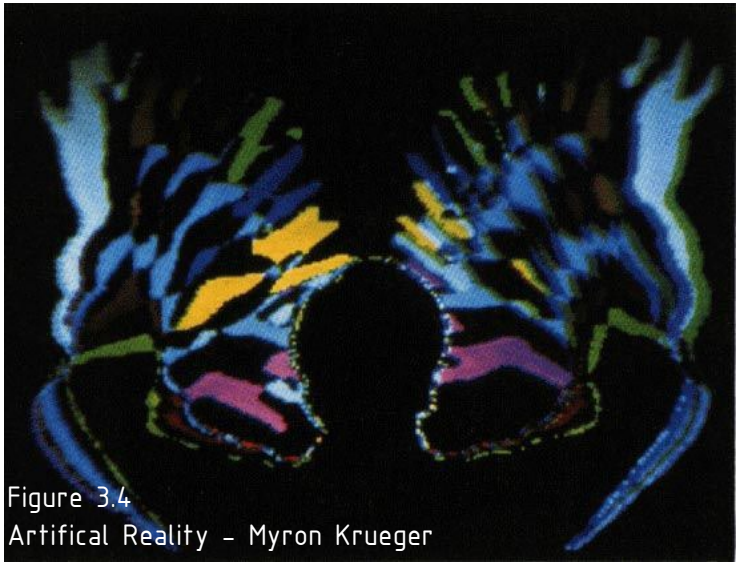


Figure 3.4
Artifical Reality - Myron Krueger

The merging of the head mounted display and simulations didn't come until 1979 when McDonnell-Douglas Corp. integrated VR into its HMD. The VITAL helmet (Figure 3.5) was born and was used for military application. The head tracker in the HMD followed the pilots eye movement to match computer generated images. Three years later, Furness also created simulation that was integrated into a HMD and was dubbed the Visually Coupled Airborne Systems Simulator (VCASS). 1985 was another great year for VR technology. Jaron Lanier and Thomas Zimmerman founded Visual Programming Language (VPL) Research Inc. they were the first company to sell VR goggles and gloves. Lanier is considered the founding father of VR and essentially coined the term "Virtual Reality"

Figure 3.5
VITAL Helmet - McDonnell-Douglas Corp.

It wasn't until 1995 that the video game industry finally picked up on the idea of using VR in its product. Nintendo launched the Virtual Boy console which played 3D monochromatic video games. It was, however, considered a commercial failure due to the lack of color graphics, lack of software support and it wasn't very comfortable to use. Children complained about the strain that it caused on their eyes and it was so uncomfortable that they could only use it for a few minutes.

VR took a 15 year hiatus before a very young engineer named Palmer Luckey created the first prototype of the Oculus Rift headset in 2010. It featured a 90 degree field of view (FOV). His prototype refreshed the interest in VR technology and its capabilities. In 2012, Luckey launched a Kickstarter campaign for the Oculus Rift headset and raised $2.4 million for his project. In the same year, video game developer, John Carmack took a deep interest in Luckeys Oculus Rift prototype and brought it to the e3 expo to showcase its potential in VR gaming. Carmack revealed a compatible version of Doom 3 running off of the Oculus Rift. This showcase was a great success for the Oculus Rift and its potential in the industry. Since then, Carmack took the CTO position at Oculus VR.

This major interest in VR technology brought other companies out to try their hand at creating something better. Some of the major players that began working on prototypes were Sony, Google, Samsung, and HTC to name a few. Facebook also went in on the explosion of VR excitement and bought Oculus Rift to the tune of $2 billion. 2016 brought the first wave of readily available VR headsets to the public. HTC was the first company to incorporate sensors with their VR headsets

and motion controls. Lastly, 2018 brought us the Oculus half dome that allows for 140 degree FOV. This is just the beginning of VR technology and we will continue to see advancements that will make science fictions books non-fiction.

VR of Today

Taking a look into what virtual reality companies are doing in today's setting, we can see that virtual reality is steadily becoming a mainstay within our physical world. Looking into what companies such as Dreamscape, Pixo, and Facebook are doing with VR technology and what innovations they are creating. Some of the concepts that they are beginning to look into are the specific technologies that are required to actualize the virtual world, how we can interact with each other within these virtual social spaces, and how we use the elements to create a simulation that allows us to train employees in dangerous occupations.

Dreamscape is newly created virtual reality entertainment company based in Los Angeles. This is a direct product from a leading virtual reality company called Artanim. What they essentially done is create a virtual world that is bound within a dark room that could potentially expand to the size of a football field. They have brought this hybrid feeling of the virtual world to the real world. Instead of creating a space for a single user, they took the approach of creating a large space that can hold multiple users. It is with the use of real world props located within the sandbox that allows the users to interact with the virtual world. An example of a space they have created is one in which you are archeologist exploring a ancient Egyptian tomb. This virtual space is created in the physical world with props that can be used within the virtual world. For example, in certain areas they place simple sticks in the real world that will be seen as a torch on the virtual world. Some of the issues that they have begun to describe and possible solutions to each of the problems:

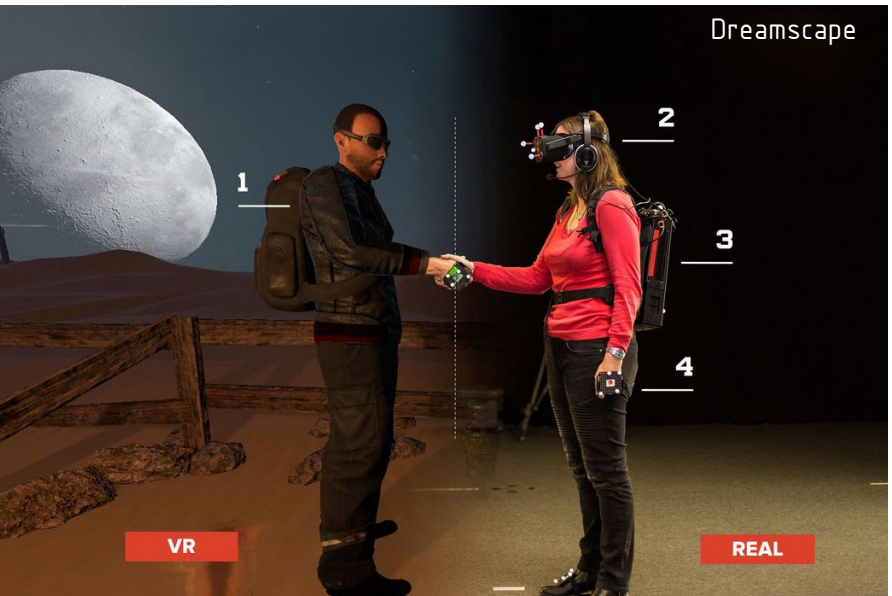
"The solution developed tackles the following technical challenges:

1) we generate a full body animation using inverse kinematics from a minimal number of markers to keep the user's setup time as short as possible, while ensuring a good tracking accuracy;

2) the platform is multi-user and the VR headset interfaces wirelessly with the motion capture system;

3) the interaction with the objects is flawless and retargeted correctly;

4) the position and orientation of the user's head is adequately handled to minimize latency (which would result in possible discomfort with the VR headset) and to maximize positioning accuracy."



Facebook has also taken its stab at the social experiences a person might have with the virtual world. One can assume that Facebook has taken a large interest with virtual reality when they bought Oculus Rift from Luckey for $2 billion back in 2012. Oculus has been hard at work creating a new way for user to interact within a live concert with its new app called Oculus Venues. This allows people to attend the concert with a virtual reality headset from to comfort of their home. This wasn't the first VR event that has been held but it is the first time that people can do so together. "VR platforms have been able to accommodate small crowds of people for just about as long. But as Venues' inaugural event, this will be the first time they'll be able to do it together, hundreds or even thousands at a time—talking with their friends, meeting new people, seat-hopping at will, and even ascending to a private viewing box if the crowd gets to be too much." One of the main issues that arose from this event was people's ability to navigate the virtual venue. It seems that most users get disoriented in the virtual world since they are not technically moving like they would within the real world. The solution that may remedy

this problem is the ability to toggle between two modes. The first being content mode, in which the user can lock their avatar into a certain area that allows for viewing of the event. The other mode is navigation mode. This allows the user to freely move their avatar to interact with other users within the same venue. This allows for an ultimate experience that ranges from social interaction to a simple movie theater experience where you are focused on the performance.

Pixo VR is a company that is more focused on the simulation aspect of the virtual world. They are masters at crafting virtual environments in which employees can being training in dangerous environments without the actual dangers. These simulations range from simple things such as how to properly attach a harness when working on high rise buildings to more serious scenarios such as events that a first responder might be called into like an explosion of some sort. One of the more crucial elements that the program solves is its ability to randomly generate scenarios that truly put the employees experience to the test. This allows for millions of different problems with millions of different solutions. The use of virtual training simulation allows for a great learning experience. "Trainees enter a 360°, active learning environment, experiencing sights and sounds that dissolve the barrier between virtual and actual reality. Using the headset and controllers, trainees look, speak, and move about freely in a photo-realistic, AAA-game quality, 3D setting, interacting with simulated real-world tools, machinery, and other trainees and instructors in virtual work spaces." It is only a matter of time where we need to get architects involved in these scenarios in order to give a deeper meaning to the buildings that people use within the virtual world.


Construction Simulation - PixoVR

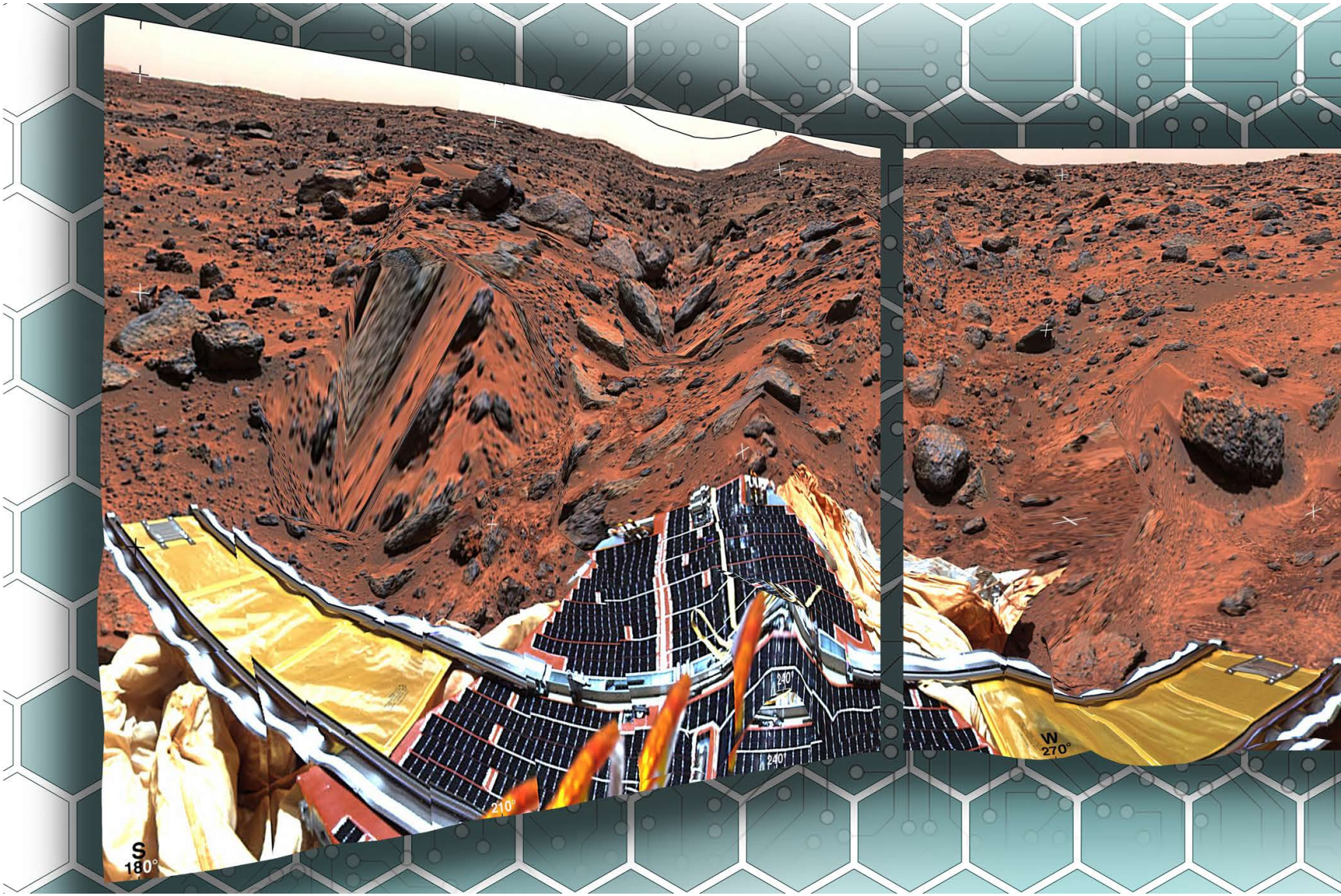
Creating a Virtual Hybrid

After looking into all of these elements, we can create a VR experience to test our theories. A VR cave could be the best way to explore these ideas of a virtual social space and how user can interact within it. This initial design is one that is hybrid in nature. The space that we are looking at is virtual but the social interaction is one that is physical. These are meant to be experienced with pairs of people rather than a group of individuals. The first in this line of VR cave installments was how we could take a spiritual space into the virtual world. These three images are looking to explore the certain feelings that one can experience while in a virtual church. The slight differences take into account what one might want to do in these spaces in order to make it more unique to what they feel within a church setting. The last image is one in which we take the church away from the realm of earth and allow it to hover in space. This allows the user to experience the church as it was meant to be experienced, an out of world experience. The possibilities could be endless as to what can done within this space. Even use the church as a storytelling element that would allow for a stronger social interaction with the subject at hand.

These image give us an idea as to what other social experiences one can be a part of without leave the comfort of their homes. The possibility watching a baseball game and having to social interaction with other VR users in this virtual ballpark. We also have the ability to send VR users to different planets to experience a world

that is completely different than ours. What type of an impact would architecture have on places that we have never managed to design for? The virtual world allows us to explore these ideas and how they may impact the way we design for planets such as Mars, if we ever do decide to expand the reach of mankind.

Lastly, virtual worlds will allow us to create spaces that can be used for general purposes such as a simple board room for employees that may be located across the globe. This allows for an instant social interaction that goes beyond the use of a group call. We begin to see each other and interact as if we were in the same room. Another idea that has been in development is this idea of a virtual hospital that will allow for some types of rehabilitation purposes that don't necessarily require a direct visit to the doctor's office. The use of virtual reality is limitless and can change the way we interact with each other around the globe. It is not only used for entertainment purposes but can also be used for training, connecting people, and the possibility to heal those in need.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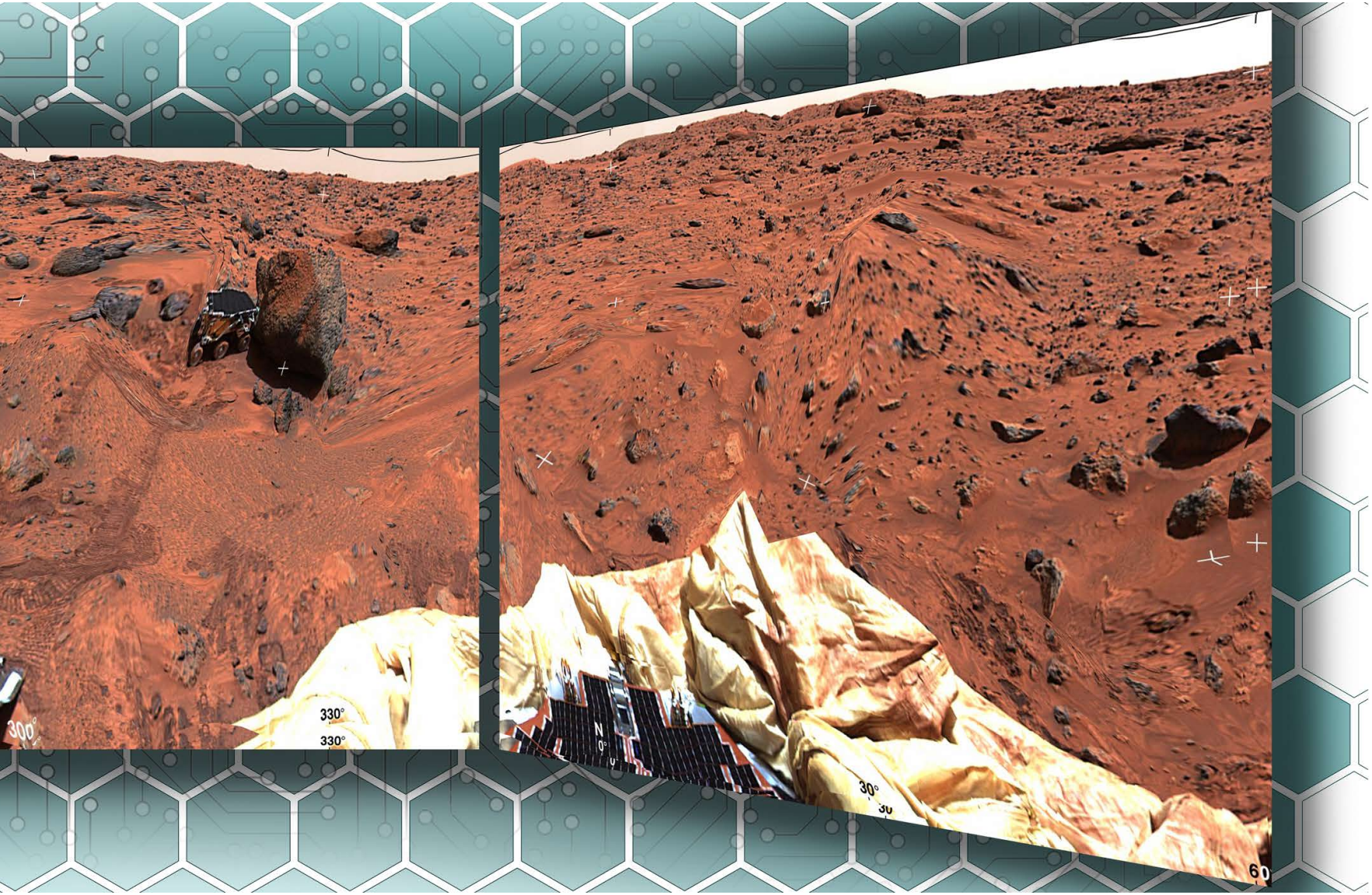
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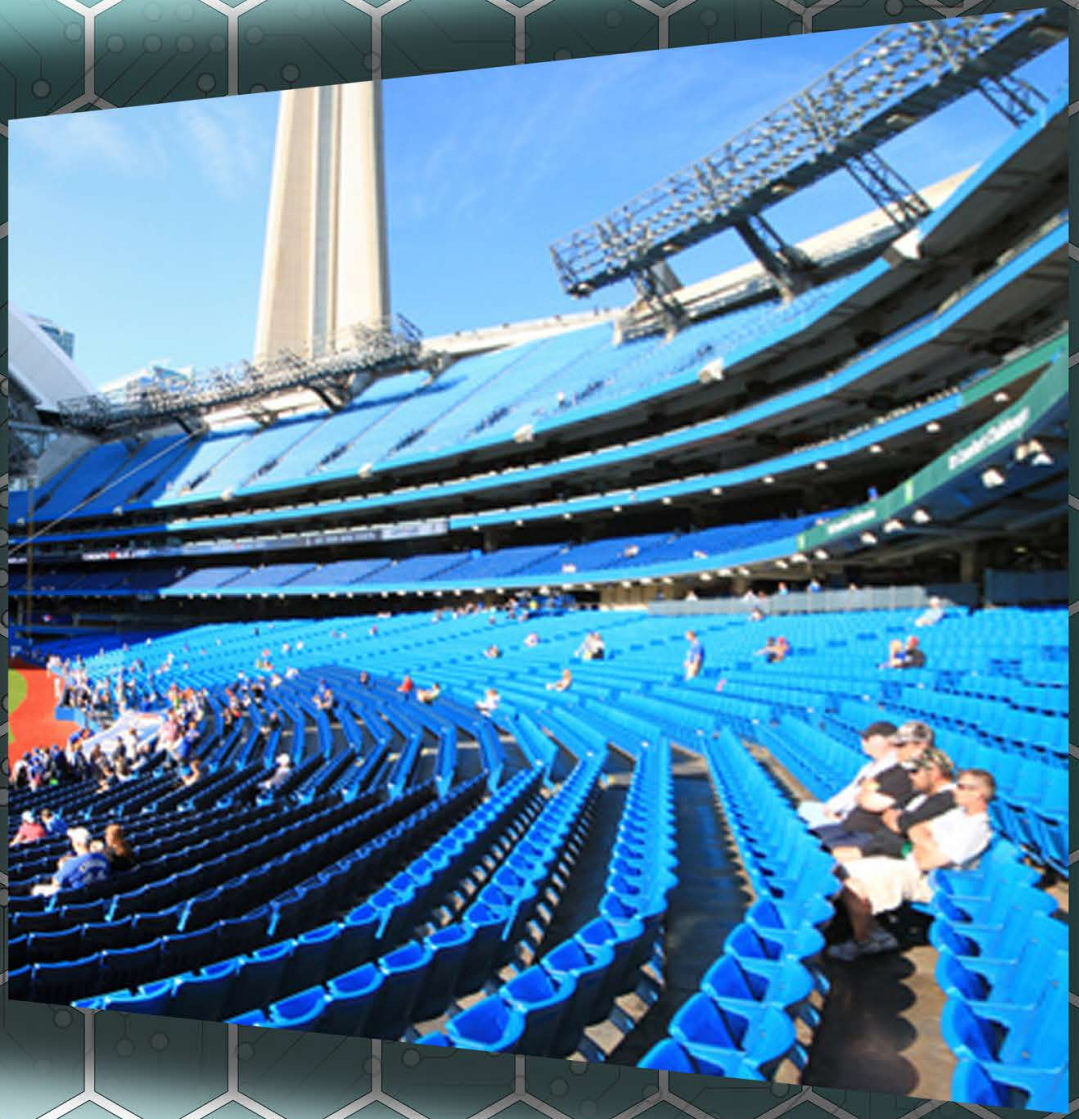


Architectural Storytelling

What is architecture? Many have perceptions of what architecture is and usually vary within each individual. It isn't until we can make our own definition that we can being to understand what it means to be an architect to us. Rudolph and Hoffman have an interesting take on architecture and is something that resonated with the development of this thesis:

"Architecture is not a question of the purely theoretical if you're interested in building buildings. It's the art of what is possible."
- Paul Rudolph

"Architecture is an untapped source of magnificent stories waiting to be imagined, visualized, and built."
- Matthew Hoffman

Architecture has evolved over the years to become what some might call an artform. What was once meant as a means to protect against the fierce unpredictable power of mother nature, now has become a culmination of different topics and ideas that we express within our designs. Many have begun to add emotion, science, imagiation, and stories to better express what they fell. So what is architecture to me? Architecture, in esense, is a powerful tool to tell stories of generations once forgotten or yet to be discovered. It is a living object that that inherents the attributes of those that design and use it. It is a character that wants to tell the story of those it protects.

Video games can have a major impact on many of those that experience a new world for the first time. Many peoples first contact with video games have come in some of its earliest forms such as Pac-Man, Tetris, and Space Invaders. Those initial games have come a long way in the past two decades and now the video game industry has surpassed Hollywood in the revenue it takes in yearly. As it stands in 2018, video game revenue hit $137.9 billion while film has managed to bring in about a third of that at $41.5 billion. One of the many reasons as to why they have such a difference is thanks to storytelling. Film can only do so much when it comes to what a person can experience, it only has one story and it is on

"rails" (meaning you have no control as to what happens and how the main character interacts with the world.) Video games give you a much more intimate experience as to how you go about the story and what you can do within the virtual space. We become invested in what we have our avatar do in this virtual world and whether or not they become the hero or villain.

What does this have to do with architecture? One might believe that they have no real correlation with each other, but they are more similar than you may think. Architecture plays an important role in the storytelling of both the real and virtual world. It is architecture that gives us an idea as to how we view our society. If given an image of certain architectural styles, most can pinpoint its origin and this begins to give us this picture of the people and the world that it is set in. In this same way the architectural environment in the virtual world opens up our imagination as to what type of world we have just entered and the types of avatars we may encounter.

Mass Effect - Bioware

Architectural Storytelling: Video games

Two of the most iconic and visually stimulating worlds that have come from the video game industry have been Halo and Bioshock. Whether it is the megastructures Forerunner installations known as the Halo Array or the neoclassical "City in the Clouds" called Columbia. Each of these have a unique and interesting story that is tied to them and influence the actions that the narrative takes in order to immerse the users. I a way, these digital structure take a character of their own and begin to tell a story like no other.

The Halo Array is a group of megastructures and superweapons that are part of 2001 science fiction story of Halo. This array is comprised of ring-shaped worlds known as Halos and a main control hub called the Ark. They are referred to as "Installations" by their AI monitors, and were created by an ancient race known as the Forerunners. In Halo, the main group of antagonists known as the Covenant, refer to the Halos as the "Sacred Rings", believing them

to form part of a greater religious prophecy known as "The Great Journey". You later begin to uncover the true purpose of the Halos and what it means to activate one. The Forerunners built the Halo Array to contain and study the Flood, an infectious alien parasite. The rings act together as a weapon of last resort and when fired, they kill any sentient life capable of falling prey to the Flood, starving the parasite of its food.

In addition to serving as weapons of last resort, Halo installations are also research facilities dedicated to containing and studying many different kinds of life forms. The life forms that were hand-selected by the Librarian included marine life, fauna, and land vertebrates. With the Master Builder's permission, the Librarian would research each animal to detect if their bodies reacted to Flood infection. The research on the animals would be more deeply analyzed if they did become infected. The Librarian's studies also helped determine if the rings could be used to repopulate the galaxy as part of the Conservation Measure.

Halo has been renowned as one of the greatest franchises of modern gaming time and is even recognized by Jamin Warren as the "most creative architectural game," remarking that "the brutalist-inspired architecture of the series exerted a strong influence on the way players move through levels and makes the battles in the game more immersive." Warren also notes that many of the Halo development staff had a background in architecture.

This is an example of what an imaginative architectural design can have on futuristic storytelling. What about manipulating history in order to tell a story of a possible alternate historic timeline? Bioshock makes this vision possible with its interesting take on American history and innovative technology. Columbia floats above the North American continent and is comprised of neoclassical buildings similar to those present within the "White City" of the 1893 Chicago World's Fair. The design relies heavily upon Neoclassical and colonial American influences for its architecture.

The U.S. government intended Columbia to be a showcase of American exceptionalism. Through

tours across various countries and lands, America would be capable of spreading its vision of the future and the "American ideal" to others. The final goal achieved was far from what the U.S. government ever intended, but instead became a floating nightmare.

This emerging utopia had its flaws, though they were not seen as problems by its leadership. Comstock and his regime, "The Founders", believed that Columbia embodied the true society envisioned by the Founding Fathers of the United States, where white Anglo-Saxons ruled over the world and that their country served a higher purpose in "civilizing" through military might and propagating their particular brand of religion. To many Columbians, America had turned away from its divine purpose, having abandoned slavery, religion, militarism, and racial supremacy. America and the rest of the world below were viewed with contempt, described as "the Sodom Below," a sinful and chaotic world which only deserved to be destroyed. Columbia in comparison was referred to as "Another Ark, for Another Time" by its citizens, meaning the city was the only source of goodness and order, and once Columbia destroyed the rest of the world, everything could restart pure and anew under the city's absolute rule. Due to Comstock's dogma, Columbians had a very narrow perspective of American history; President Abraham Lincoln was labeled "The Apostate" by Columbia for ending slavery. His killer, John Wilkes Booth, was revered as a saint. The Columbian perspective of the Civil War is that of a demonic Lincoln leading a barbarous horde against the saintly Confederate forces under a deified George Washington, underscoring Columbian beliefs about racial slavery, as well as the anarchistic nature of the "false" America.

Storytelling has always played a vital role in the development of video games and the way we see certain aspects as good or bad. Architecture should be placed at the forefront of these stories and should be revered as characters and not just environments where we engage with other avatars.

Bioshock: Infinite – 2K Games

Storytelling

Storytelling, like architecture, has been around since the beginning of humankind. It is one of the ways we communicate with one another and is a powerful tool of someone's imagination. In essence, storytelling is trying to tell an event that has had some sort of impact on your life that made you feel a certain way. It is with storytelling that you can begin to express these feeling and great storytelling allows for the audience to feel the same way. It is this self knowledge and awareness that allows us to create this thought provoking story that other will relate to.

So what are some ideas that we can take away to create a wonderful storytelling experience? Pixar, known for creating some of this generation's greatest children's films, shared some of their knowledge and recipe for creating a beautiful storytelling experience. Emma Coats, director and storyboard artist at Pixar, tweeted out her 22 rules of storytelling and compiled this list to share to the world:

1. You admire a character for trying more than for their successes.
2. You gotta keep in mind what's interesting to you as an audience, not what's fun to do as a writer. They can be v. different.
3. Trying for theme is important, but you won't see what the story is actually about til you're at the end of it. Now rewrite.
4. Once upon a time there was ____. Every day, ____. One day ____. Because of that, ____. Because of that, ____. Until finally ____.
5. Simplify. Focus. Combine characters. Hop over detours. You'll feel like you're losing valuable stuff but it sets you free.
6. What is your character good at, comfortable with? Throw the polar opposite at them. Challenge them. How do they deal?
7. Come up with your ending before you figure out your middle. Seriously. Endings are hard, get yours working up front.
8. Finish your story, let go even if it's not perfect. In an ideal world you have both, but move on. Do better next time.
9. When you're stuck, make a list of what WOULDN'T happen next. Lots of times the material to get you unstuck will show up.

10. Pull apart the stories you like. What you like in them is a part of you; you've got to recognize it before you can use it.
11. Putting it on paper lets you start fixing it. If it stays in your head, a perfect idea, you'll never share it with anyone.
12. Discount the 1st thing that comes to mind. And the 2nd, 3rd, 4th, 5th – get the obvious out of the way. Surprise yourself.
13. Give your characters opinions. Passive/malleable might seem likable to you as you write, but it's poison to the audience.
14. Why must you tell THIS story? What's the belief burning within you that your story feeds off of? That's the heart of it.
15. If you were your character, in this situation, how would you feel? Honesty lends credibility to unbelievable situations.
16. What are the stakes? Give us reason to root for the character. What happens if they don't succeed? Stack the odds against.
17. No work is ever wasted. If it's not working, let go and move on – it'll come back around to be useful later.
18. You have to know yourself: the difference between doing your best & fussing. Story is testing, not refining.
19. Coincidences to get characters into trouble are great; coincidences to get them out of it are cheating.
20. Exercise: take the building blocks of a movie you dislike. How d'you rearrange them into what you DO like?
21. You gotta identify with your situation/ characters, can't just write 'cool'. What would make YOU act that way?
22. What's the essence of your story? Most economical telling of it? If you know that, you can build out from there.

Storytelling has a profound effect on the way that our brain functions and the reasons as to why we become interested or "hooked" to a story. Giovanni Rodriquez breaks down these three neurochemical reactions that are brain has as we become invested in a story. These can be used as powerful tools that an architect might be able to use as he creates a story driven structure.

"First, there's cortisol, which gets produced when something warrants our attention, like distress. Where we hear about potential threats in our

environment -- or hear something distressing in a story -- cortisol helps us stay attentive." Overall, we become more invested in the story because we become more focused as to what is happening. This is primarily due to cortisol activating our "fight or flight" and in turn make us more aware of a situation.

"Next comes a far more popular compound -- so much has been written about it -- called dopamine. This gets produced to aid in an elaborate learning system that rewards us (with pleasure) when when we follow the emotionally charged events in a story." Dopamine becomes the compliment to cortisol in a sense that it rewards us for staying focused on the story and is essentially the arousal substance.

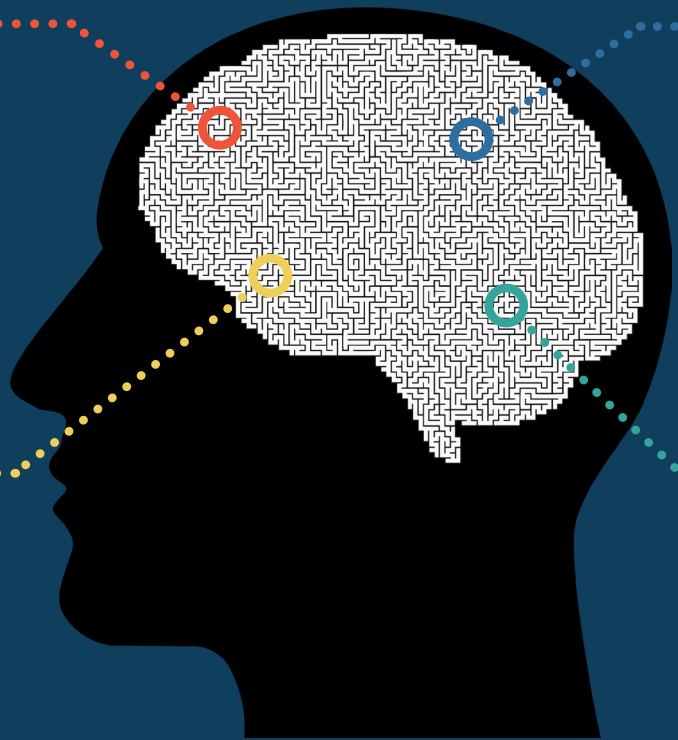
"And then comes what could very well be the wonder drug of storytelling: oxytocin. While there are many other things in the human organism that help make us social, oxytocin has been identified as a chemical that promotes prosocial, empathic behavior." Oxytocin is what allows us to feel for a certain character. We may identify with someone that is comparable to our real life experiences. There's a reason as to why someone has a favorite Game of Thrones character!

Storytelling, like architecture, has been around since the beginning of humankind. It is one of the ways we communicate with one another and is a powerful tool of someone's imagination. In essence, storytelling is trying to tell an event that has had some sort of impact on your life that made you feel a certain way. It is with storytelling that you can begin to express these feeling and great storytelling allows for the audience to feel the same way. It is this self knowledge and awareness that allows us to create this thought provoking story that other will relate to.

Now what are some of the main storytelling plots that we can expect to see and have stood the test of time? Christopher Booker broke these down into seven archetypes:

1. Overcoming the Monster
2. Rags to Riches
3. Voyage and Return
4. The Quest
5. Comedy
6. Tragedy
7. Rebirth

HOW STORYTELLING AFFECTS THE BRAIN



NEURAL COUPLING

A story activates parts in the brain that allows the listener to turn the story into their own ideas and experience thanks to a process called neural coupling.

DOPAMINE

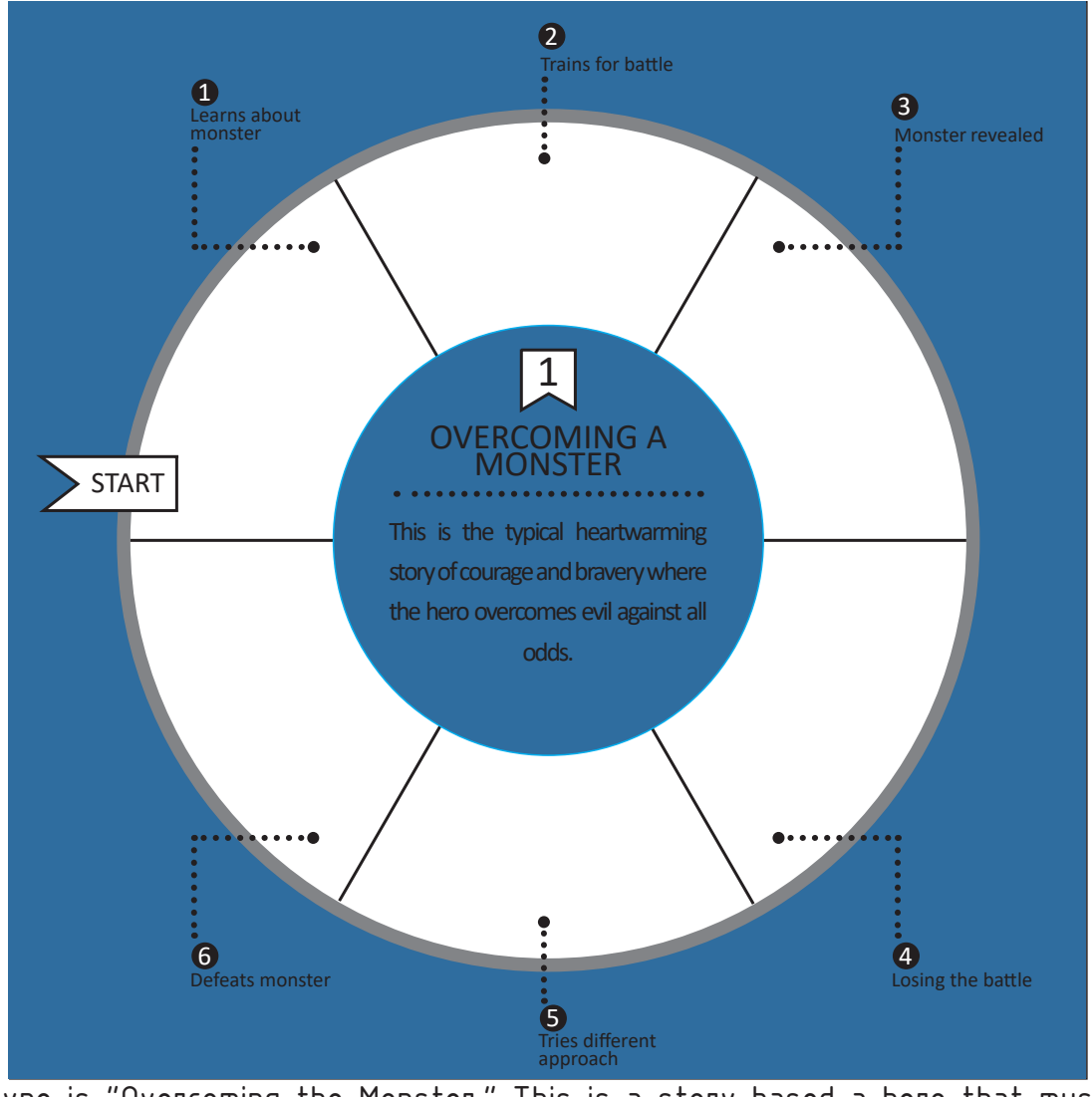
The brain releases dopamine into the system when it experiences an emotionally charged event, making it easier to remember and with greater accuracy.

MIRRORING

Listeners will not only eperience the similar brain activity to each other, but also to the speaker.

CORTEX ACTIVITY

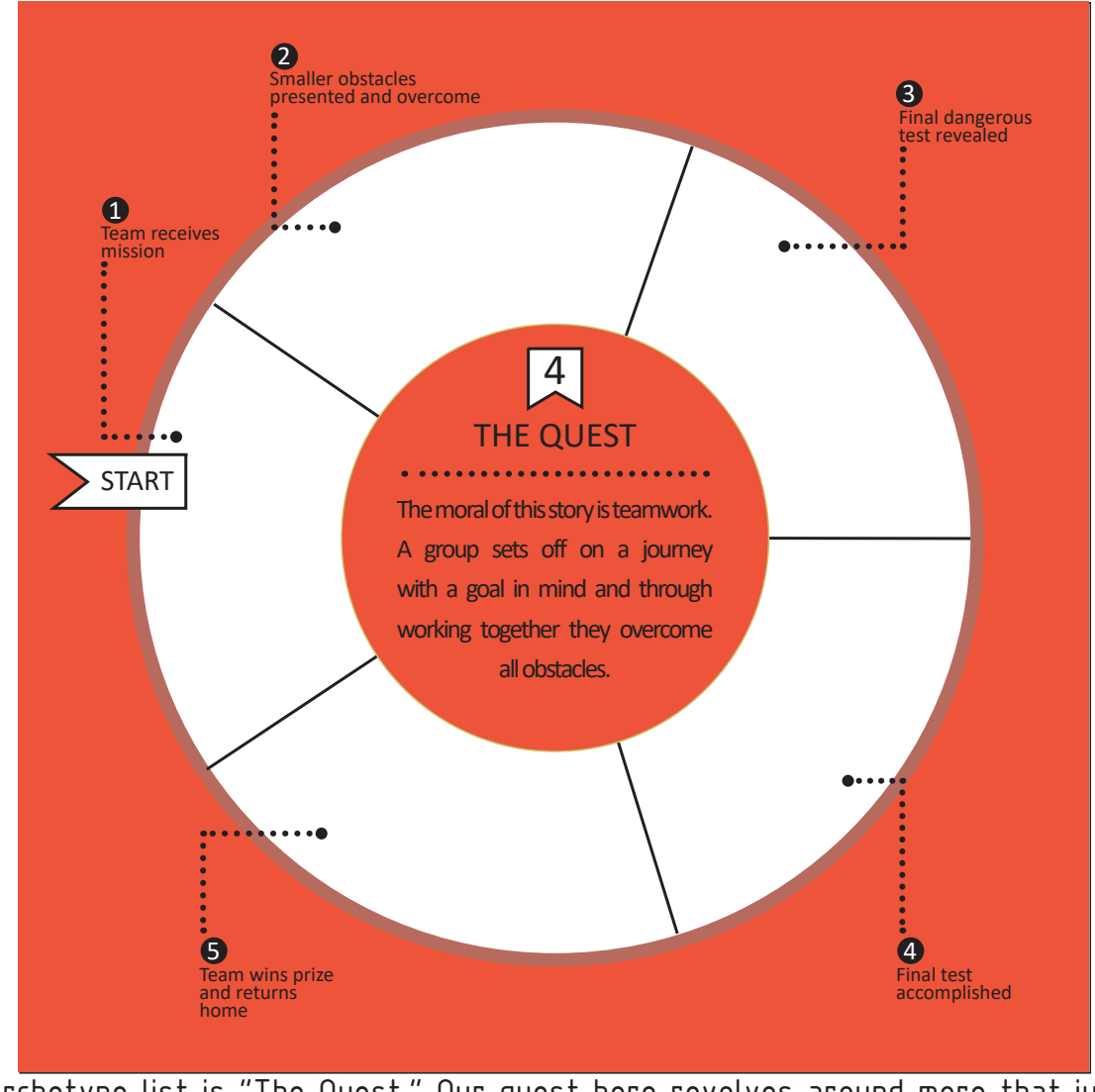
When processing facts, two areas of the brain are activated (Broca's and Wernicke's area). A well-told story can engage many additional areas, including the motor cortex, sensory cortex and frontal cortex.



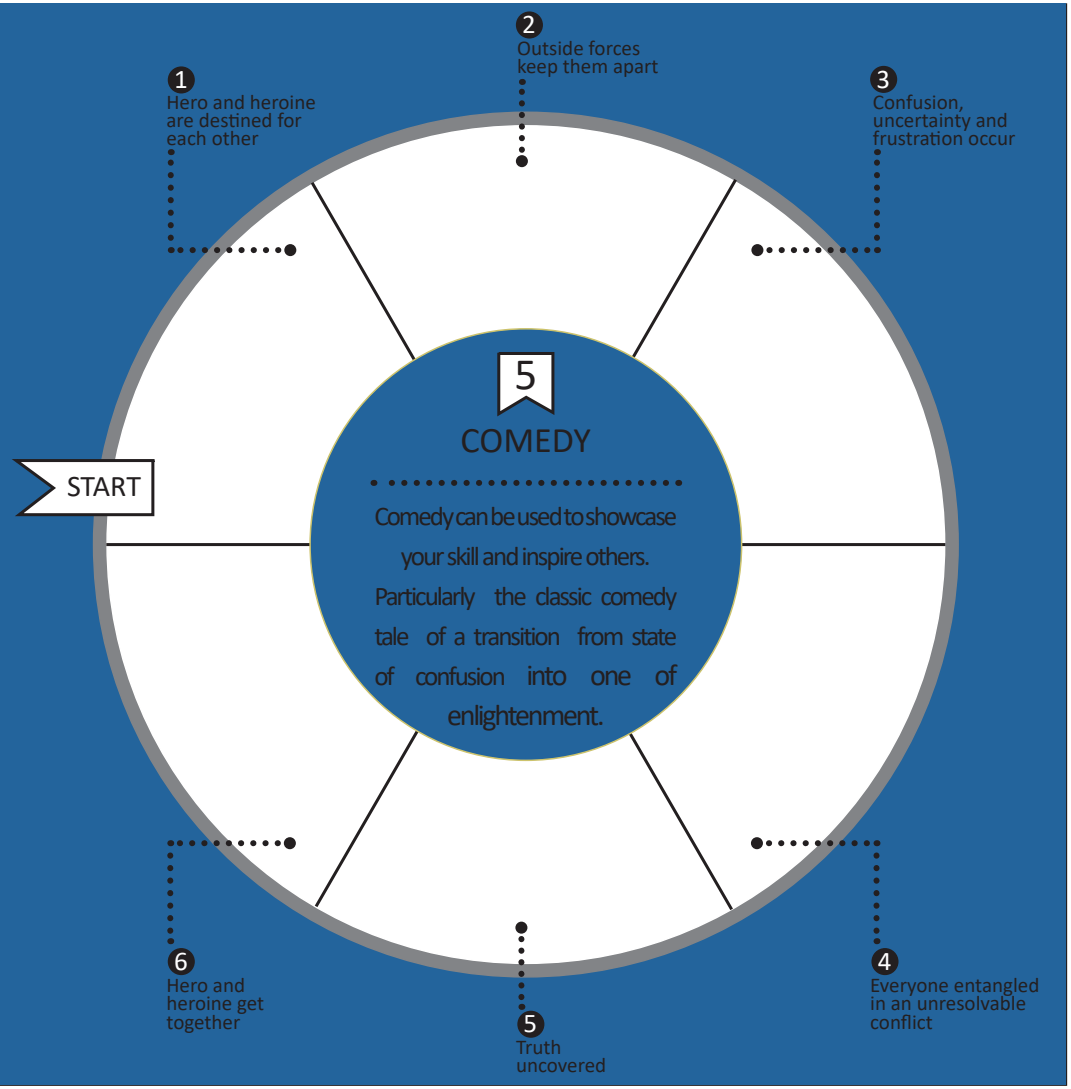
The first archetype is "Overcoming the Monster." This is a story based a hero that must defeat a monster in order to bring back peace to the world. The hero initially fails at defeating the monster on their first attempt until they become more capable through training or obtaining a certain item. An example of "Overcoming the Monster" would be Beowulf. (Take the time to doodle in some of your own story ideas within these bubbles.)

The second archetype is "Rags to Riches." The hero of this archetype is in a place of low significance and through sheer determination becomes someone of greatness. It is this use of natural talent that allows them to progress through the story, but has a hardship just as things are beginning to look up. In the end, our hero is capable of overcoming this problem and becomes a character of major importance to everyone. Aladdin is a great example of "Rags to Riches."

Our third archetype is "Voyage and Return." This revolve around a character that lives a seemingly normal life until they travel to a enchanting world. They being to explore this new world and run into some sort of darkness that they must defeat/escape. Thanks to this adventure, our hero returns home as a better because of it. A proper example of "Voyage and Return" would be The Wizard of Oz.



Fourth on the archetype list is "The Quest." Our quest here revolves around more that just one hero, but rather a company of heroes that have a similar objective. Our heroes overcome many trials and tribulations in order to complete their quest and return home with their rewards. The main focus of this archetype is the cooperation that is needed for the heroes to succeed. Lord of the Rings is one of the greatest quests in storytelling history.

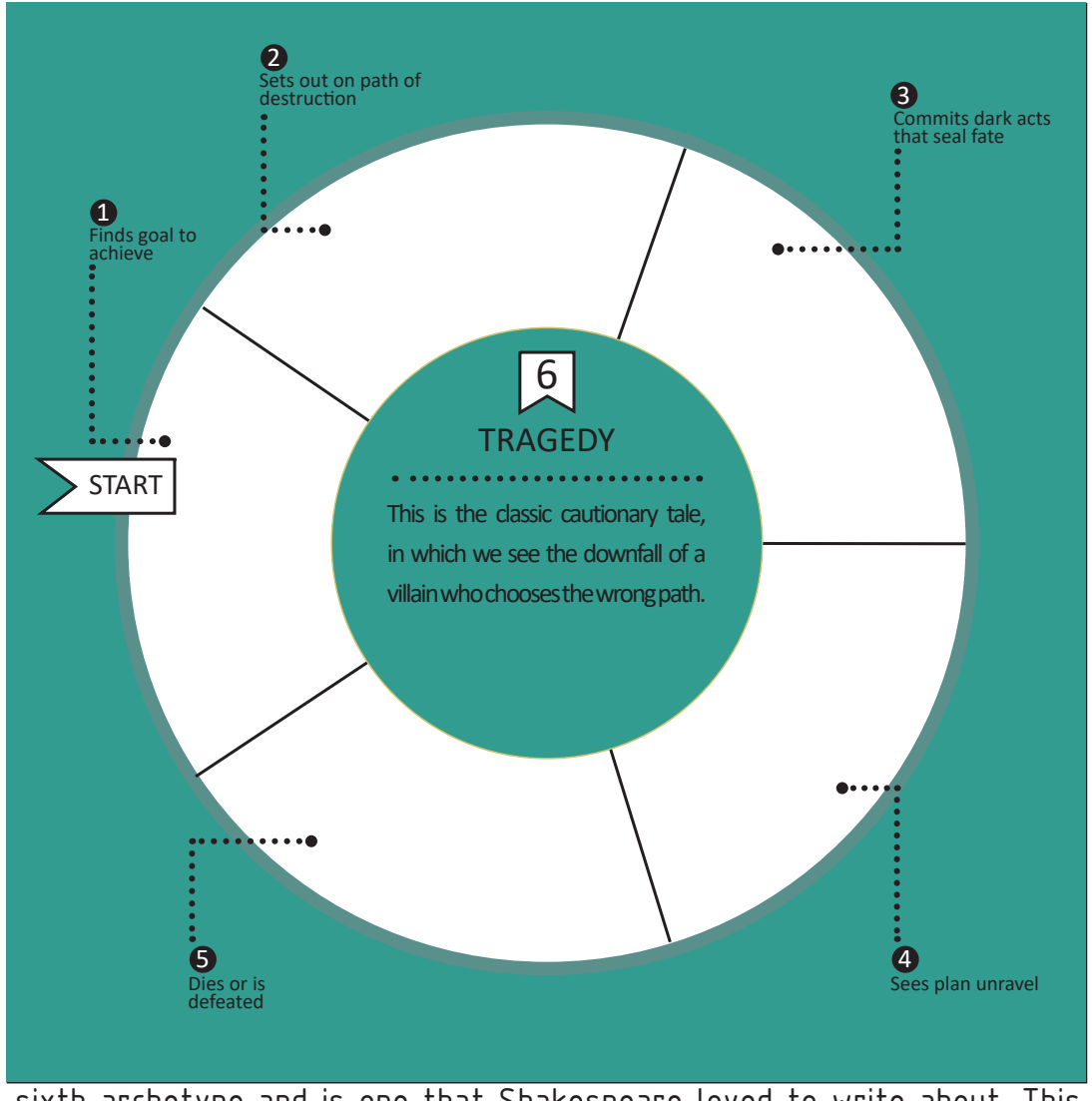


Our fifth archetype is one of our more light hearted stories "Comedy." Christopher booker has a harder time explaining a Comedy but breaks it down to three distinct stages:

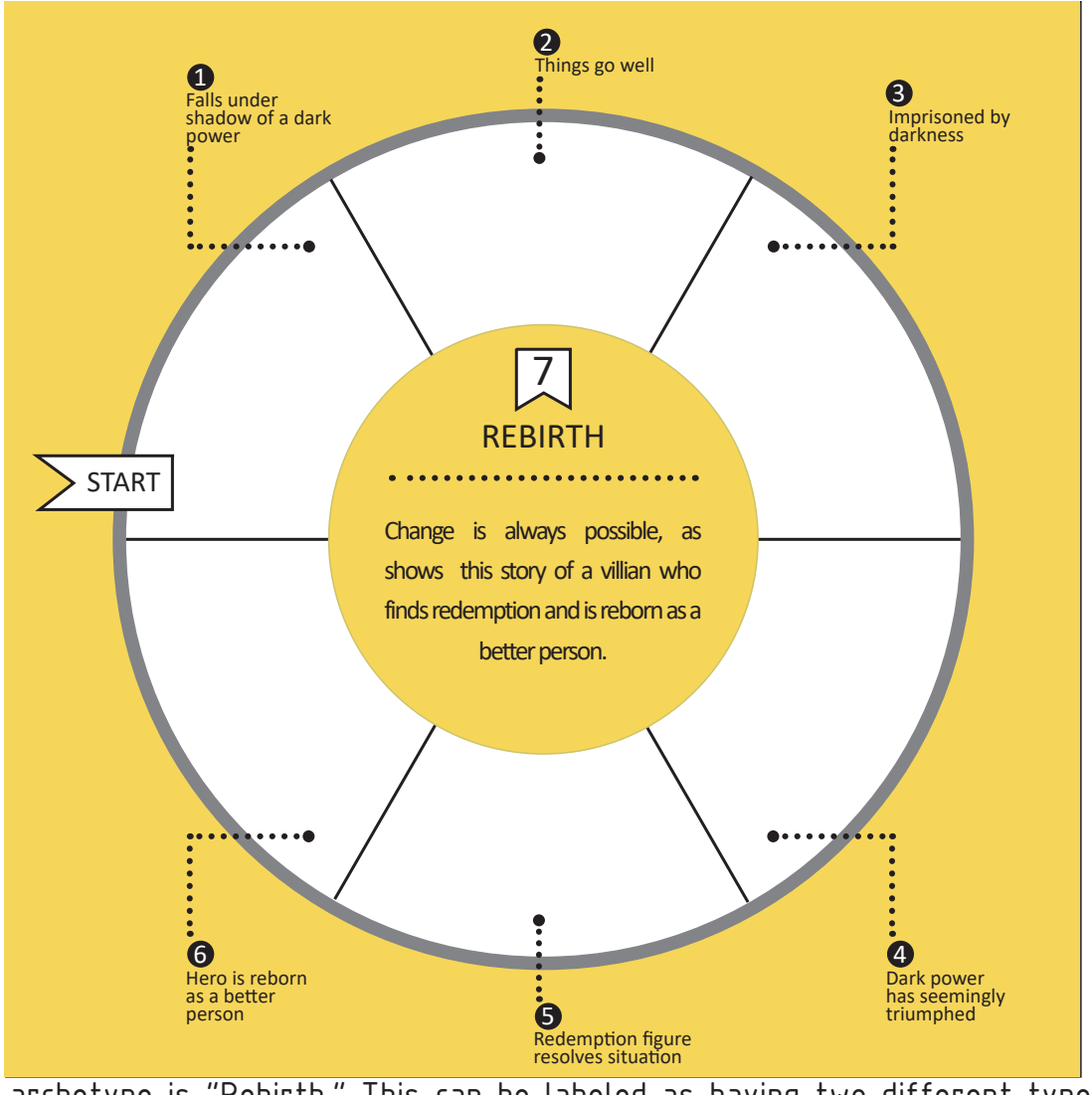
1. The story takes place in a community where the relationships between people (and by implication true love and understanding) are under the shadow of confusion, uncertainty, and frustration. Sometimes this is caused by an oppressive or self-centred person, sometimes by the hero acting in such a way, or sometimes through no one's fault.

2, The confusion worsens until it reaches a crisis.

3. The truth comes out, perceptions are changed, and the relationships are healed in love and understanding (and typically marriage for the hero).



"Tragedy" is our sixth archetype and is one that Shakespeare loved to write about. This is a tail in which our hero does not achieve his ultimate desire. Our hero has a set goal in mind, but begins to stray from his path and acts in a manner that is not fitting of a hero. Ultimately, our hero fails in the end and more than likely ends up dead. Shakespeare's Romeo and Juliet is a tail of two lover that eventually die in each others hands.



Lastly, our final archetype is "Rebirth." This can be labeled as having two different types. one being the hero being reborn as a better person. The other is where the character is freed from a curse or spell that can only be freed by another characters love. The issue with this is that our hero cannot solve their own problem and rely on someone else for a resolution. Disney's Beauty and the Beast is a classic example of the archetype.

"After nourishment, shelter and companionship, stories are the thing we need most in the world."

.....

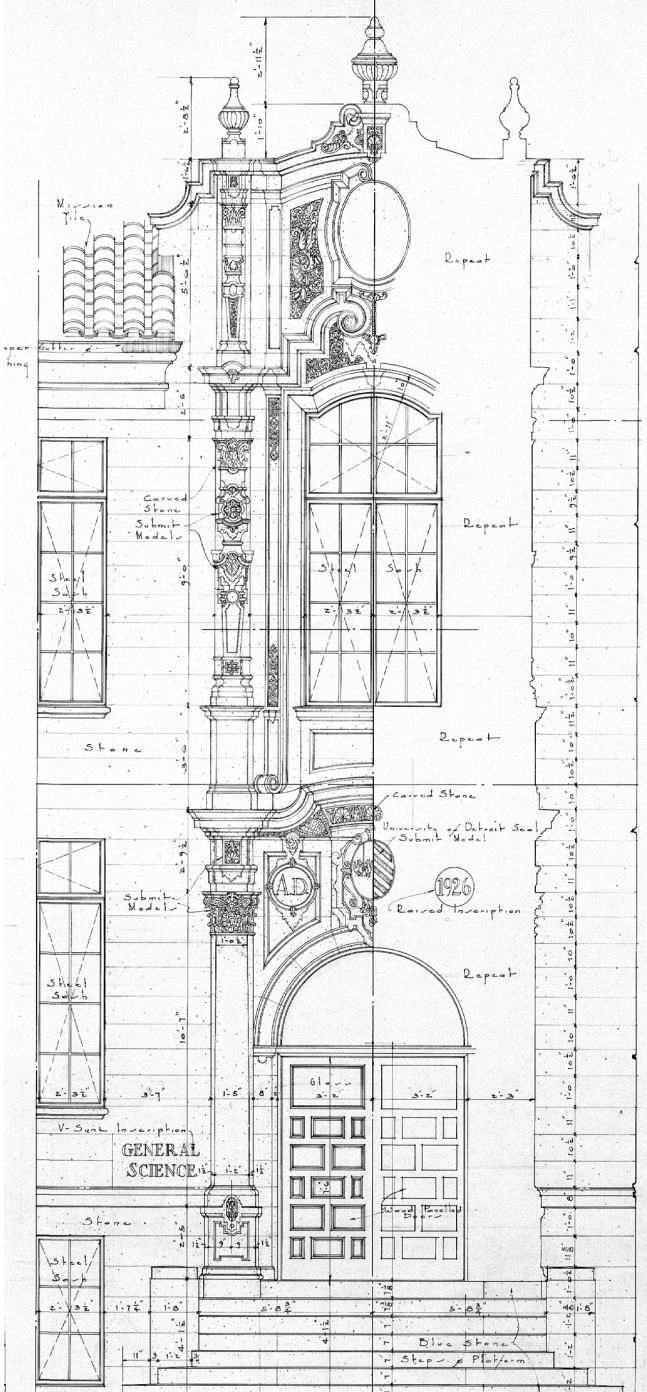
Philip Pullman

Past

Now that we have a better grasp as to what elements are involved with both storytelling and the idea of a virtual world, we can then combine the two in order to figure out the ultimate goal of how architecture can play a powerful role in storytelling when combined with the virtual world. To accomplish said goal, we will be looking the "Past, Present, and Future" as a storytelling tool.

Storytelling of the past is one that has already be carved in stone. We are merely looking back at these carvings to experience the stories of our predecessors. One may consider them the echoes of days long past. The School of Architecture is littered with these echoes and many have no idea of what the school used to be. It is this moment of wonder that has pushed the idea of historical storytelling and set itself as a unique learning tool for the current generation of students.

The University of Detroit Mercy has a long history at the McNichols Campus dating back



to the purchase in 1921. Over the last decade more buildings have been built to accompany the growing number of students. The science building was one of the original 7 buildings to the campus and still around today. This is a look into what the former science used to look like and what has changed since then. Today the building is no longer used for the science department and house the schools architecture program.

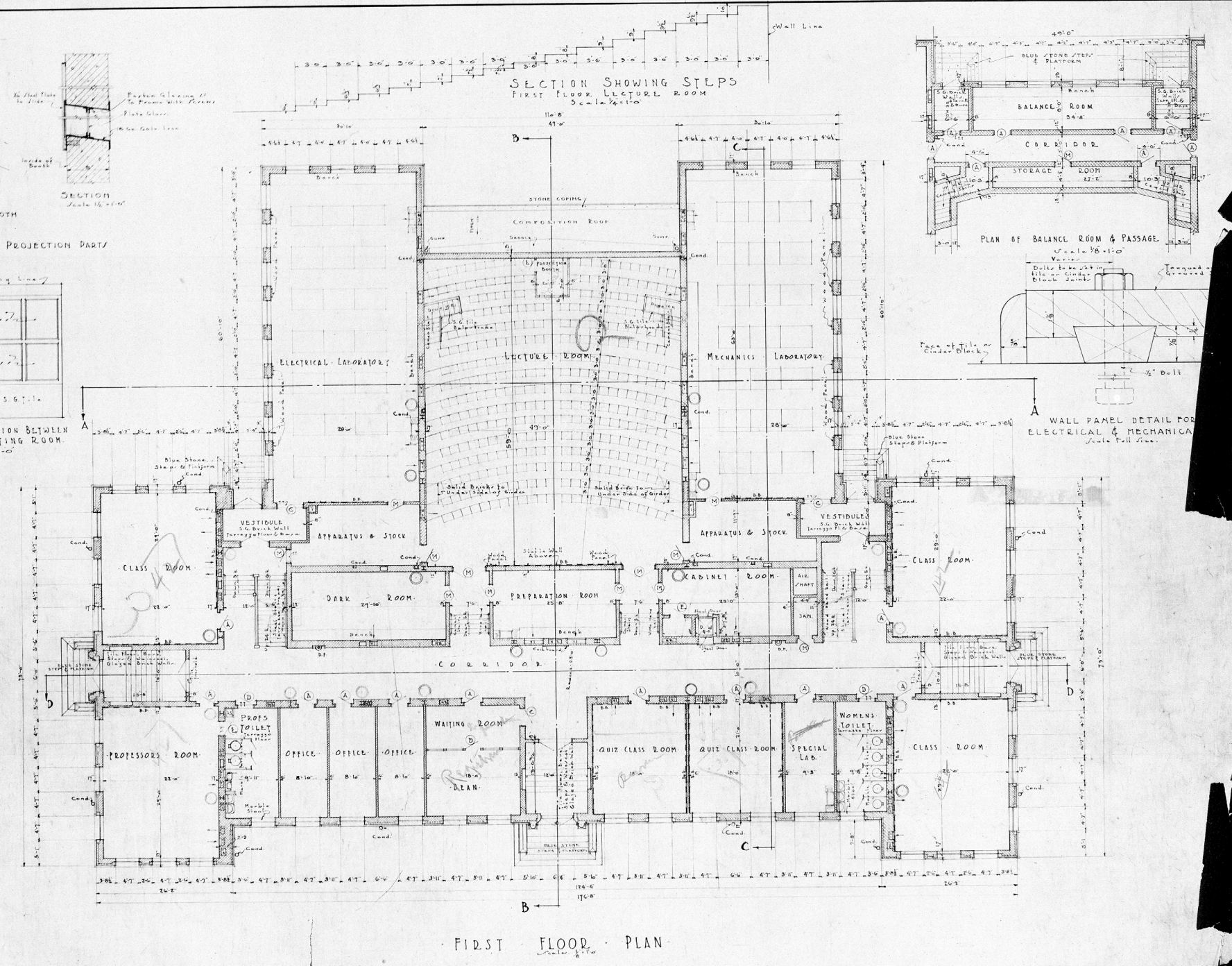
The Science Building was one of the seven original buildings designed by architects Malcomson & Higginbotham. Construction began back in 1925 and was to be completed for the fall term of 1927. This was a 46,328 sq. foot rectilinear building that was composed of limestone facade and clay tile roof that acted as the shell of the three leveled building. They deemed this building as the "Front Door" of the original campus.

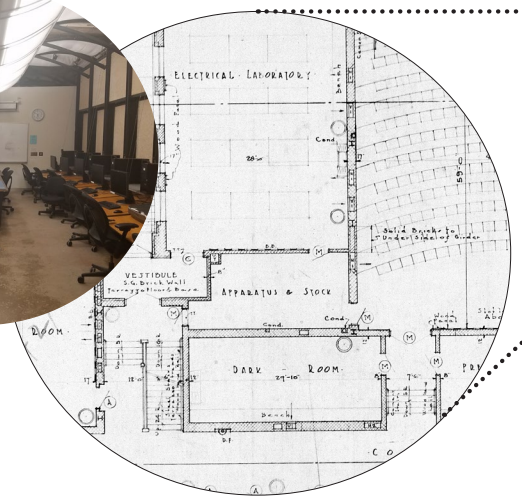
This was the building on campus that was devoted to all the scientific studies that were held for the students. You could just imagine the excitement in little Timmy's eye as he began to play with aluminum and mercury in order to see how they would react to each other. To his dismay, nothing much happened so he decided to move onto something else. It wasn't until he returned the next day that he would find this amazing formation of what looks to be a string like structure at his works station. His professor later explained to him what had happened since he last combined the two. He told him that this was the process of amalgamation. "When mercury is added to aluminum, it forms an amalgam. Aluminum is normally protected by a thick oxide layer, but the formation of the amalgam disrupts it. It allows fresh aluminum to react with air to form white aluminum oxide. As the oxide grows, it forms as these cool white fibers." it was at this time that Timmy finally understood what he want to do as a profession. "I want to become a chemical engineer."

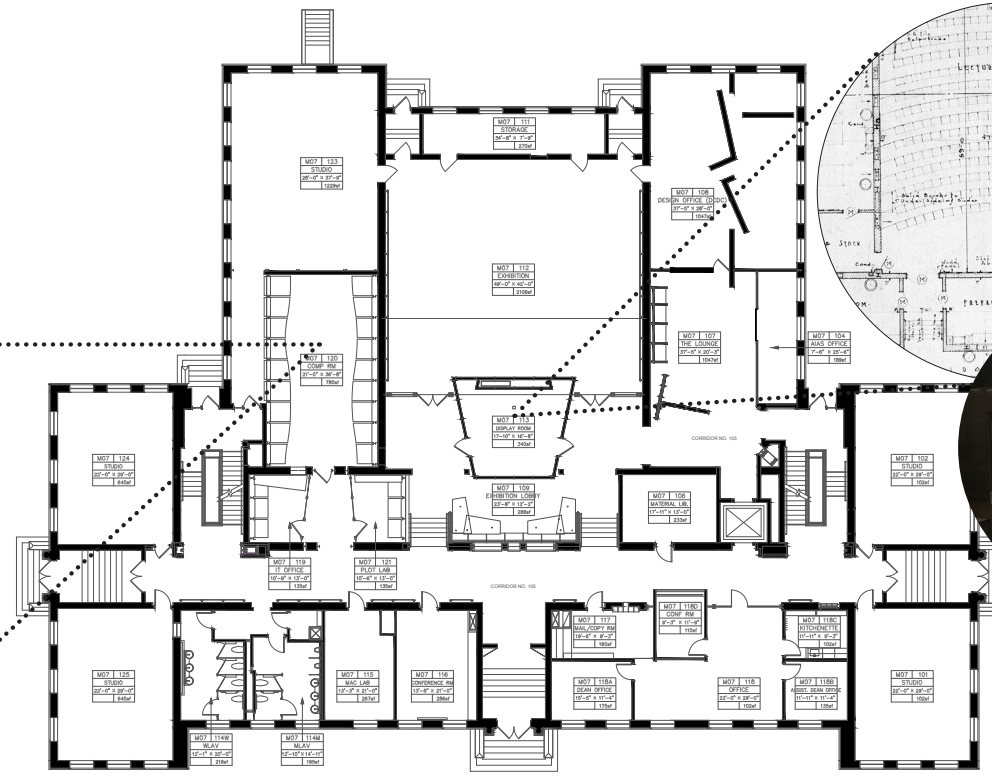
These are the types of stories that we can begin to uncover if we are able to combine the uses of architecture with that of the virtual world. We have an opportunity to open these echoes of our past wider to witness the glorious lives and stories of those before us. We may not know every detail of 90 year old stories but architecture gives us a sense of what could have possibly happened thanks to old drawings and the still existing footprints of

walls and doors that used to be.

Now is a prime opportunity to begin collecting data and stories from people of the present day. Things of today become history by tomorrow. We can use technology to document the stories of today in order for people to use on a later day. The twist being applied to this form is storytelling is one meant to informative. Looking into present day Fisher Building in order to identify the day-to-day activities that staff and students are constantly a part of.


SECTION SHOWING STEPS
FIRST FLOOR LECTURE ROOM
Scale 1/4"=1'-0
Wall Line
SECTION
Scale 1/2"=1'-0"
PROJECTION PARTS
PLAN OF BALANCE ROOM & PASSAGE
Scale 1/8"=1'-0
BALANCE ROOM
CORRIDOR
STORAGE ROOM
BLUE STONE STEPS & PLATFORM
WALL PANEL DETAIL FOR
ELECTRICAL & MECHANICA
ELECTRICAL LABORATORY
LECTURE ROOM
MECHANICS LABORATORY
COMPOSITION ROOF
CLASS ROOM
VESTIBULE
APPARATUS & STOCK
DARK ROOM
PREPARATION ROOM
CABINET ROOM
CORRIDOR
PROFESSORS ROOM
PROFS TOILET
OFFICE
WAITING ROOM
DEAN
QUIZ CLASS ROOM
SPECIAL LAB.
WOMENS TOILET
FIRST FLOOR PLAN


ELECTRICAL LABORATORY
VESTIBULE
APPARATUS & STOCK
DARK ROOM
ROOM


M07 | 111
STORAGE
M07 | 123
STUDIO
M07 | 108
DESIGN OFFICE (DEAN)
M07 | 112
EXHIBITION
M07 | 107
THE LOUNGE
M07 | 104
AIAS OFFICE
M07 | 120
CONF RM
M07 | 113
DISPLAY ROOM
M07 | 124
STUDIO
M07 | 109
EXHIBITION LOBBY
M07 | 106
MATERIAL LIB.
M07 | 102
STUDIO
M07 | 119
IT OFFICE
M07 | 121
PLOT LAB
CORRIDOR NO. 103
CORRIDOR NO. 105
M07 | 118D
CONF RM
M07 | 117
MAIL /COPY RM
M07 | 118C
KITCHENETTE
M07 | 125
STUDIO
M07 | 115
MAC LAB
M07 | 116
CONFERENCE RM
M07 | 118A
DEAN OFFICE
M07 | 118
OFFICE
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ASSO. DEAN OFFICE
M07 | 101
STUDIO
M07 | 114W
WLAV
M07 | 114M
MLAV

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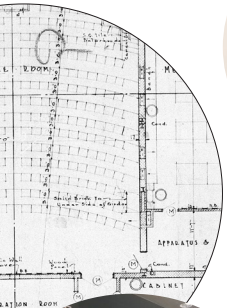
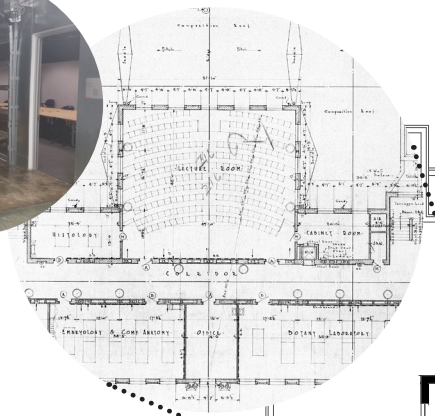
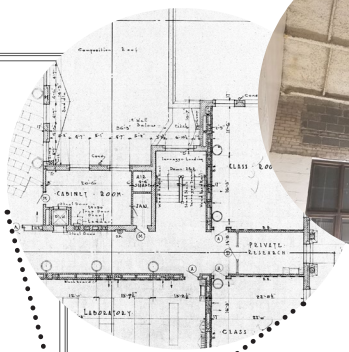
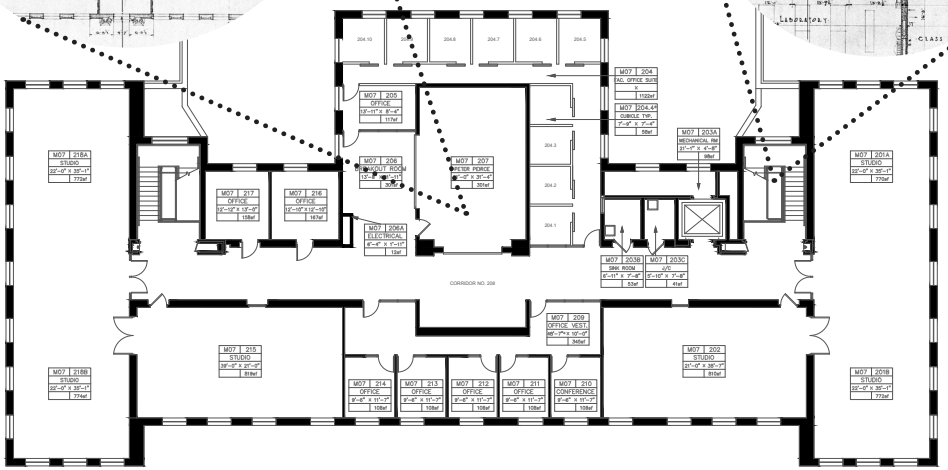








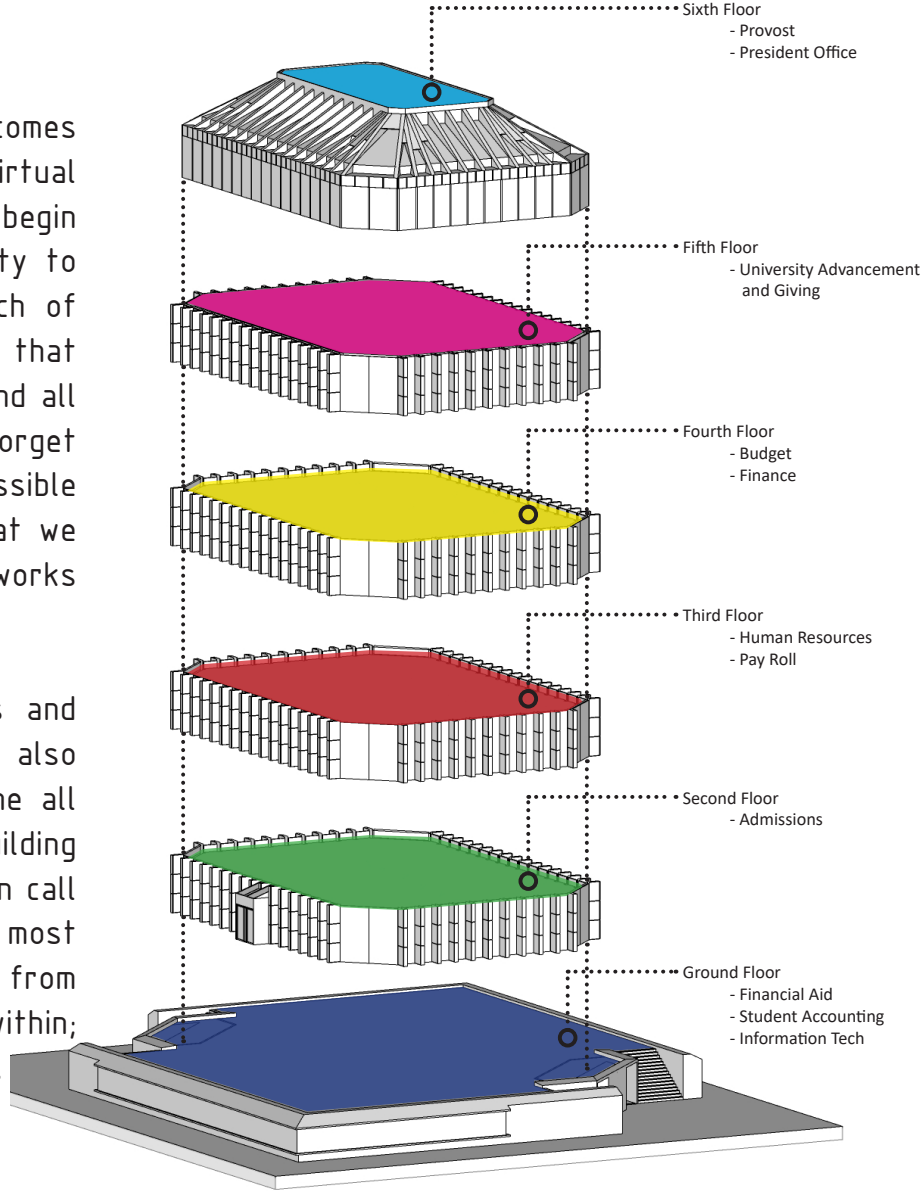
ARCHITECTURE BUILDING
FIRST LEVEL
SCALE 1/16" = 1'-0"
LAST UPDATED 10/08/2013

ARCHITECTURE BUILDING
SECOND LEVEL
SCALE 1/16" = 1'-0"
LAST UPDATED 10/08/2013

Present

Storytelling in architecture is sometimes comes in the form of information. Within this virtual representation of the Fisher Building, we begin to see the details that allow the university to function properly. We understand that each of the floor represent a different mechanism that span from financial aid, human resources, and all the way to president. What we sometimes forget are the people that make these realities possible for others on campus. It is within them that we begin to see how the storytelling process works within the Fisher Building.

This building is the heart of the campus and where most of the officiating happens. It is also the place where many stories begin for the all future student of the school. The Fisher Building has been criticized for its design. Some even call it the "radiator" or "Darth Vader." The most significant thing that they cannot take away from the building are the stories that it holds within; the stories of the students and staff.



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Position Title: Coordinator – Student Employment & Scholarships
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Kimberly VanAssche
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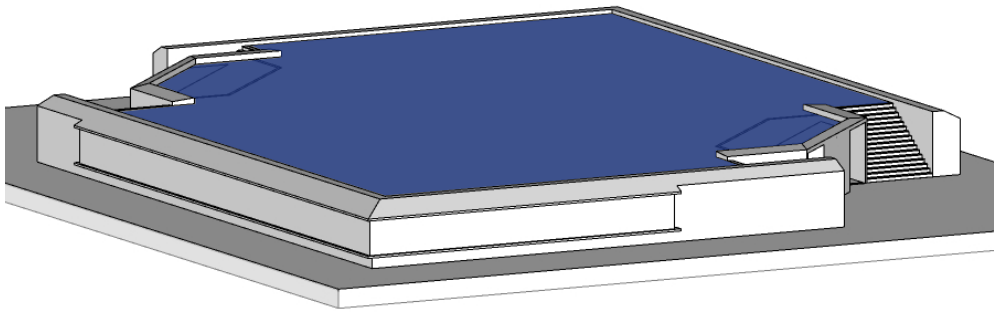

The ground floor of the Fisher Building is home to many departments such as Financial Aid, Student Accounting, and Information Technology. These are just a few of the staff members that make life easier for the students of the University of Detroit Mercy.

Joy C. Mohammed
Department: Admissions and Recruitment
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Campus #: (313) 993-1245

Weihong Sun
Department: Admissions and Recruitment
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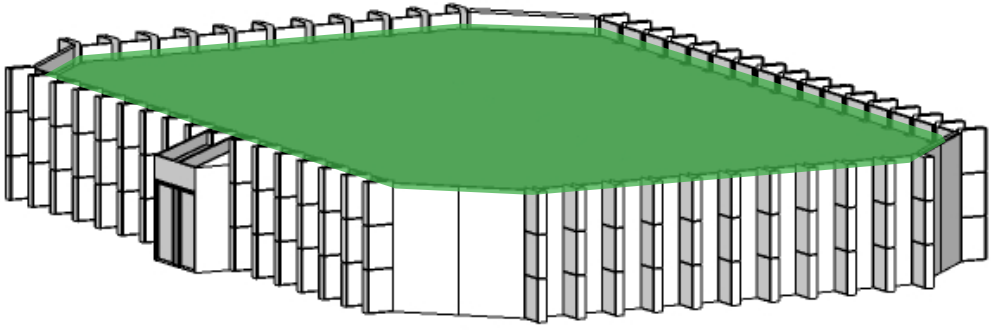
Jacqueline Bigush
Department: Admissions and Recruitment
Position Title: Assistant Director
Email Address: bigushja@udmercy.edu
Campus #: (313) 993-1245

The second floor of the Fisher Building is home to Admissions. These are the staff members that bring potential students dreams to life. The university wouldn't be what it was today if it wasn't for these people.



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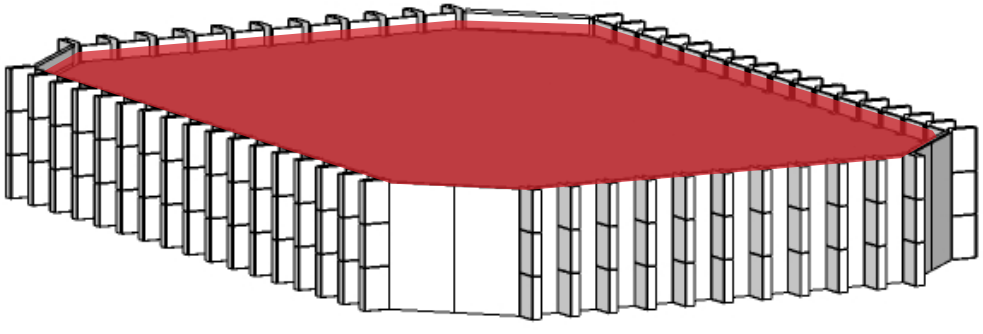

Human Resources and Payroll consider the third floor home. This is the friendly staff that makes sure everyone on staff is pleased and working as they should.

Dana D. Hart
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Lauren E. Paton
Department: Dean's Office-CHP
Position Title: Asst. Dean Finance and Business
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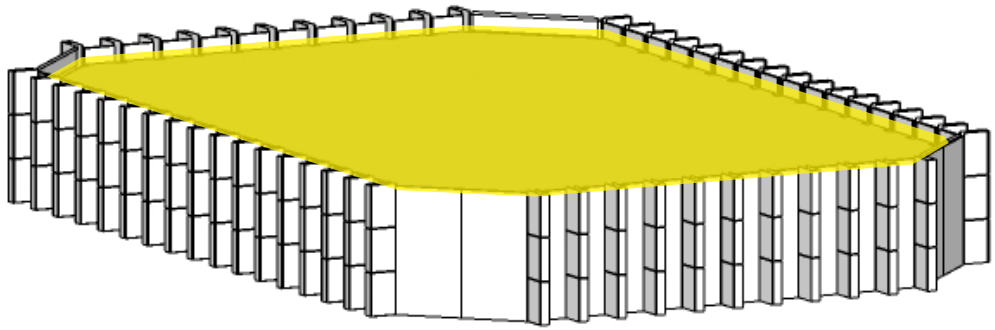
The group that sits on the fourth floor of the Fisher Building is Budget and Finance. Probably the lifeline of the school in the sense that they make everything is working properly and money goes where it needs to go.



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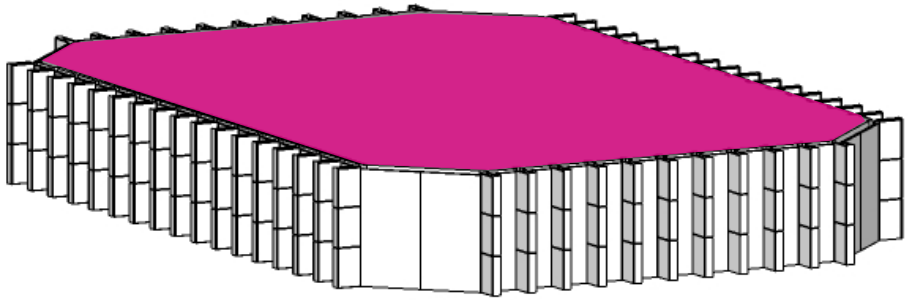

Fifth floor is one of the more charitable floors that holds University Advancement and Giving. All donations are processed through this floor and then given to the school and possibly to students in the form of scholarships.

Pamela Zarkowski
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Antoine M. Garibaldi
Department: Office of the President
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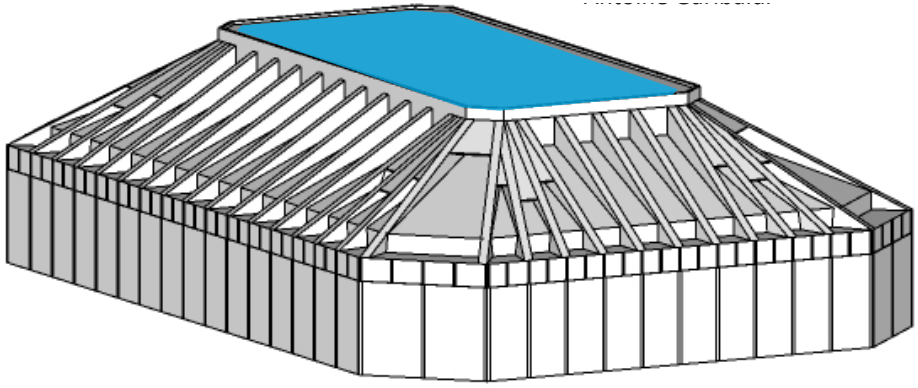
Email Address: garibaldi@udmercy.edu
Campus #: (313) 993-1455

Lastly, at the top of the Fisher Building, sits the President's Office and Provost. The president of the University of Detroit Mercy is essentially the public face for all of the other staff that make up the Fisher Building.

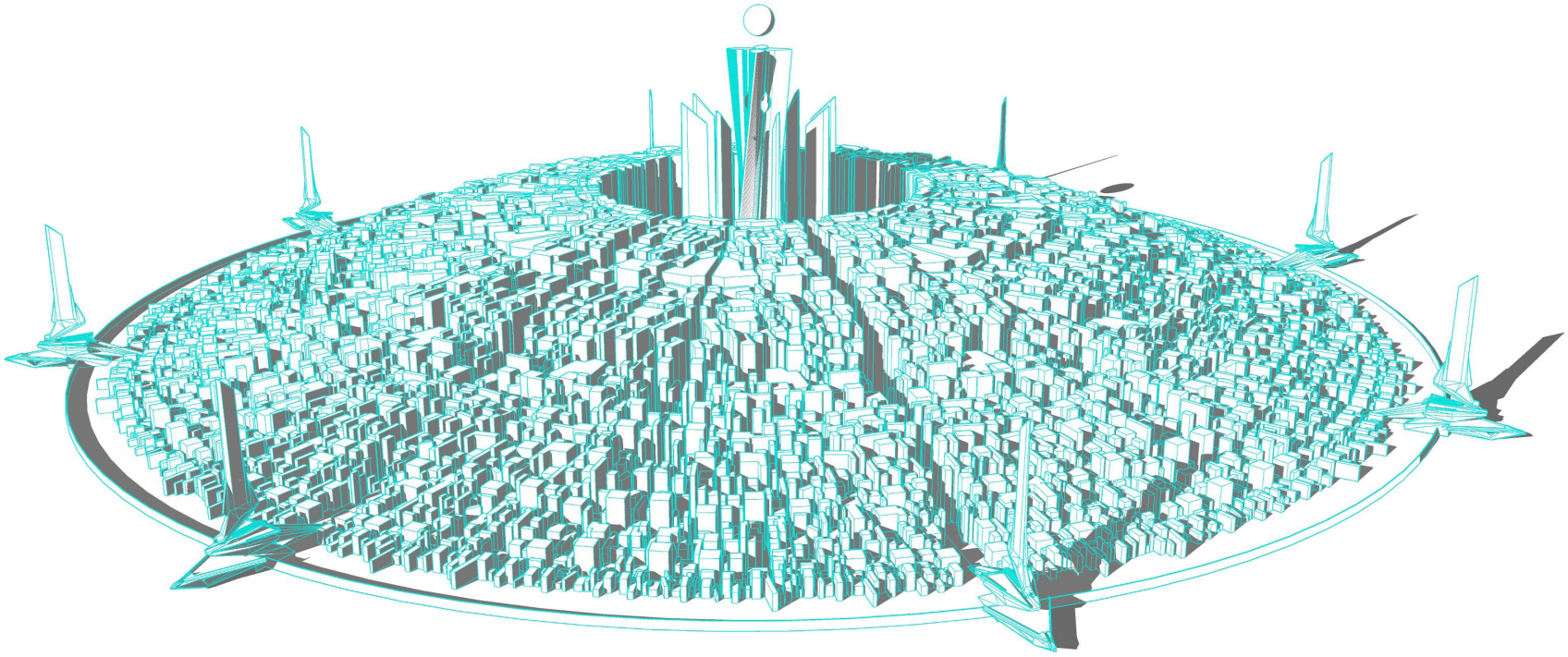


Future

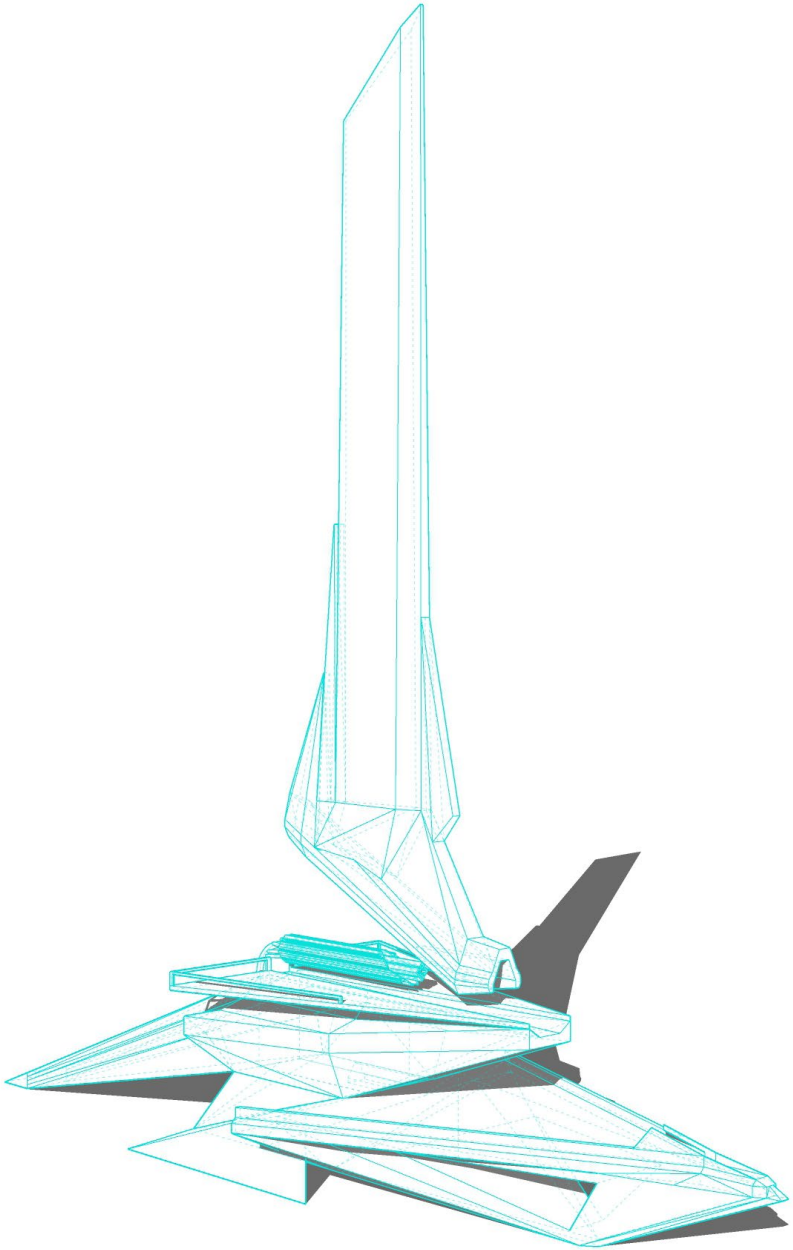
What type of story can we tell if we have no idea of what might happen in the future? This is where architecture can break out of the realm of non-fiction and become whatever the mind can imagine. One story that will come to pass, if we do not change our way of life, is that of an uninhabitable planet. This is a take on what we might see architecture become in order to keep us safe from the harsh environment of an Earth that is slowly tearing itself apart. It is within these protected super cities that we can create a livable environment and slowly begin to use technology to repair Earth to its former glory. Only time will tell if we can change our current course in order to avoid this post apocalyptic scenario. Maybe a story with a lighter future is in order to show us the differences that we may be facing.

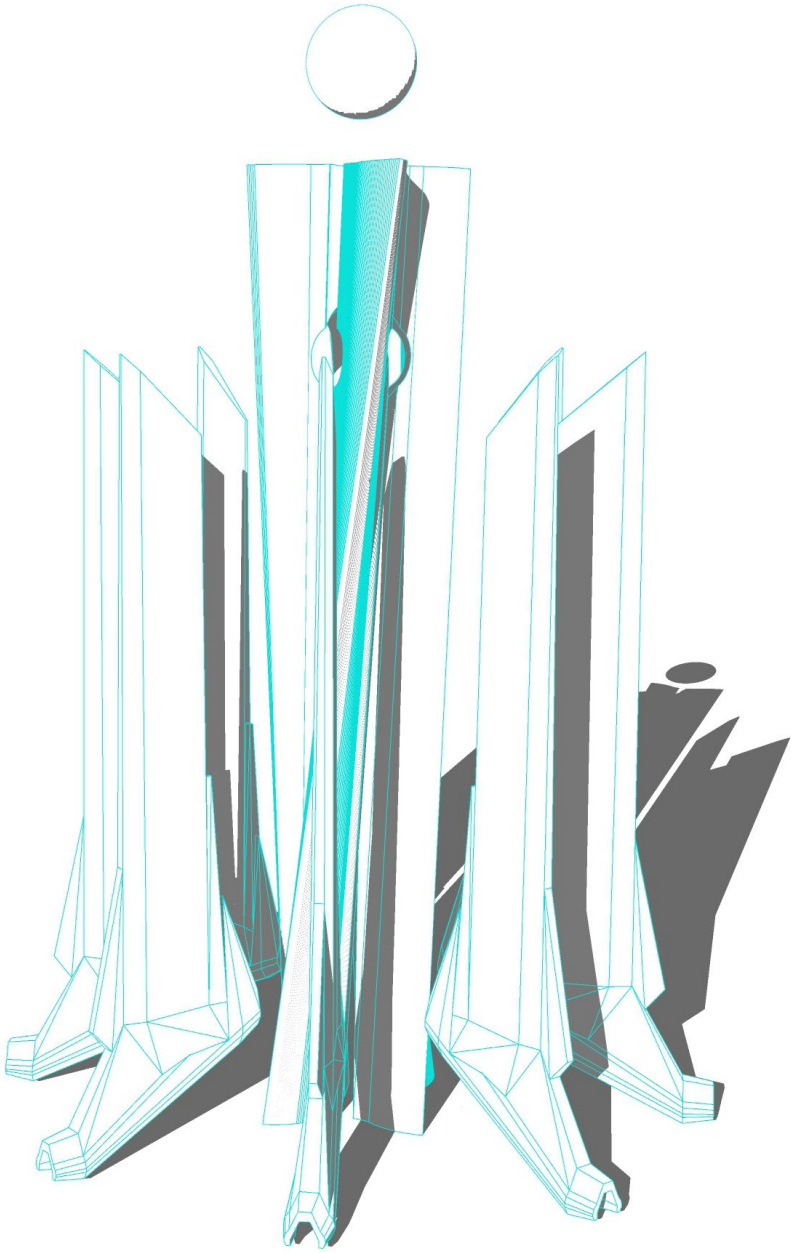
The year 2156 is upon us and we are still trying to recover from from the total collapse of the earth's ecosystem. We were told to worry about global warming but in a twist of event, were thrown into another ice age. We have seen unimaginable bone freezing temperatures that most life can't survive and we are lucky to see it hit a high of -200 degrees celsius. We have resorted to create these super cities in order to protect ourselves from the harsh conditions that are outside our protective energy dome. We were lucky enough to have this advanced technology developed for the purpose of colonizing Mars back in 2038. Why is it that i decided to stay on this frozen planet and not go to Mars with the other half of the Earth's population? Maybe it's the idea that this was our first home and now i have a duty to return it to its former glory days, before this entire mess happened.

What is it that helps us survive the harsh conditions of frozen mother Earth? The short answer would be to say the innovative technologies of man that has protected us and has slowly began to increase the overall temperature of earth by four degrees celsius every month. These are scattered all over the earth in hopes of using them as tools for the reshaping of Earth. Terraforming is a process of transforming a planet so as to resemble the Earth, mostly to support human life. We just never thought that we would be doing it to Earth.



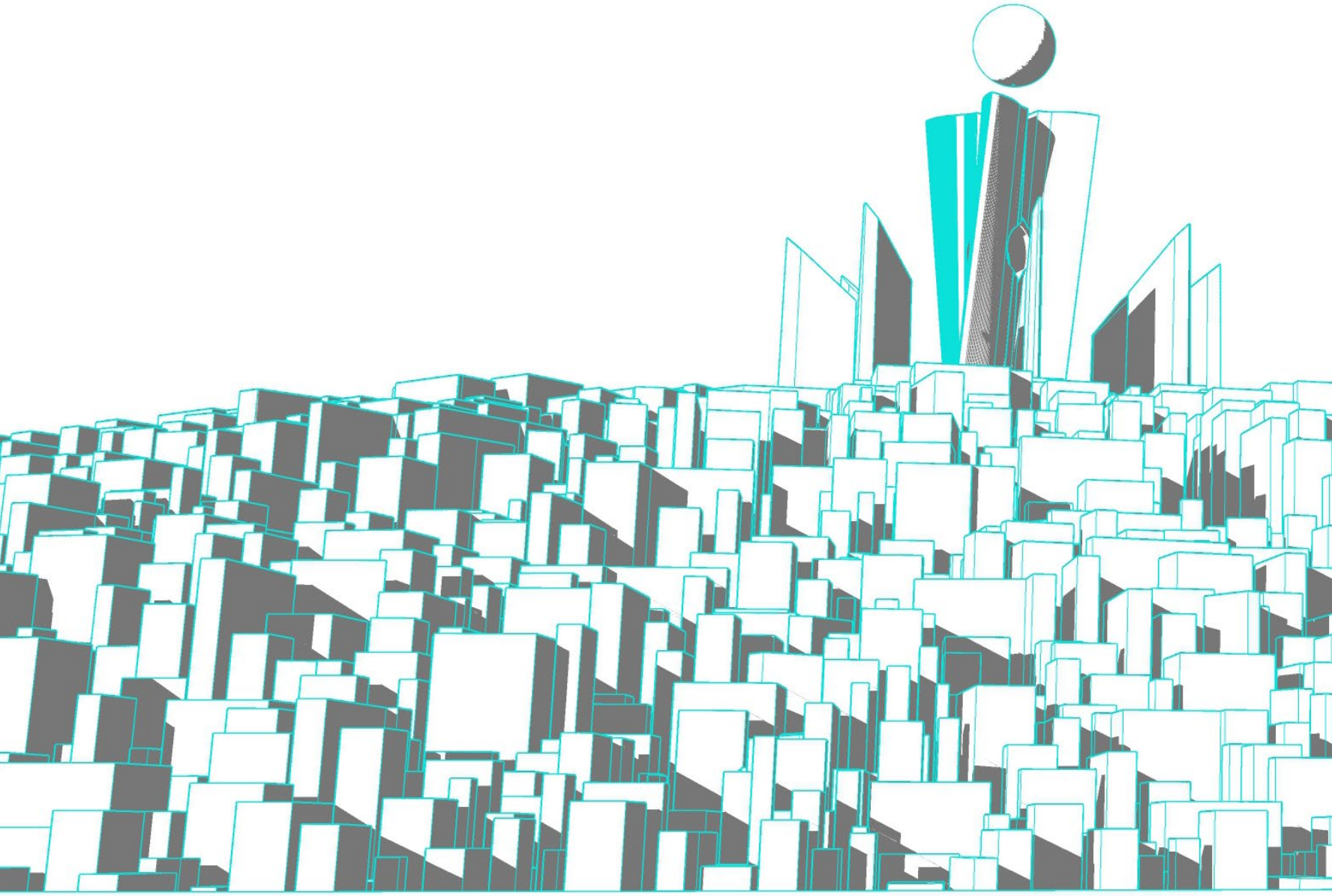
These outside spires are used as a main hub for transports and goods that come from other super cities or from the Mars population. Our city has eight of these spires located on the outskirts with other cities ranging from four all the way up to 24. These are not just for transport, but they are the primary tool that hold back against the encroaching ice and the tool that we use to fight it back. What is so amazing about these spires is how they all form a strong link between each other in order to form this dome above us. The dome is very interesting in its design and how it protects us from the frigid air. They have essentially managed to create an atmosphere that resembles that of Earth and is also capable of projecting an image of how the sky used to look like prior to this whole catastrophe. These spires are also our way of terraforming the planet back to what it was. We do this by using the energy that the center tower of the city creates and essentially inject that energy into the air outside of our dome. This has allowed us to slowly increase the exterior temperature and hold back the ice from overtaking the city and covering it like a snowglobe.

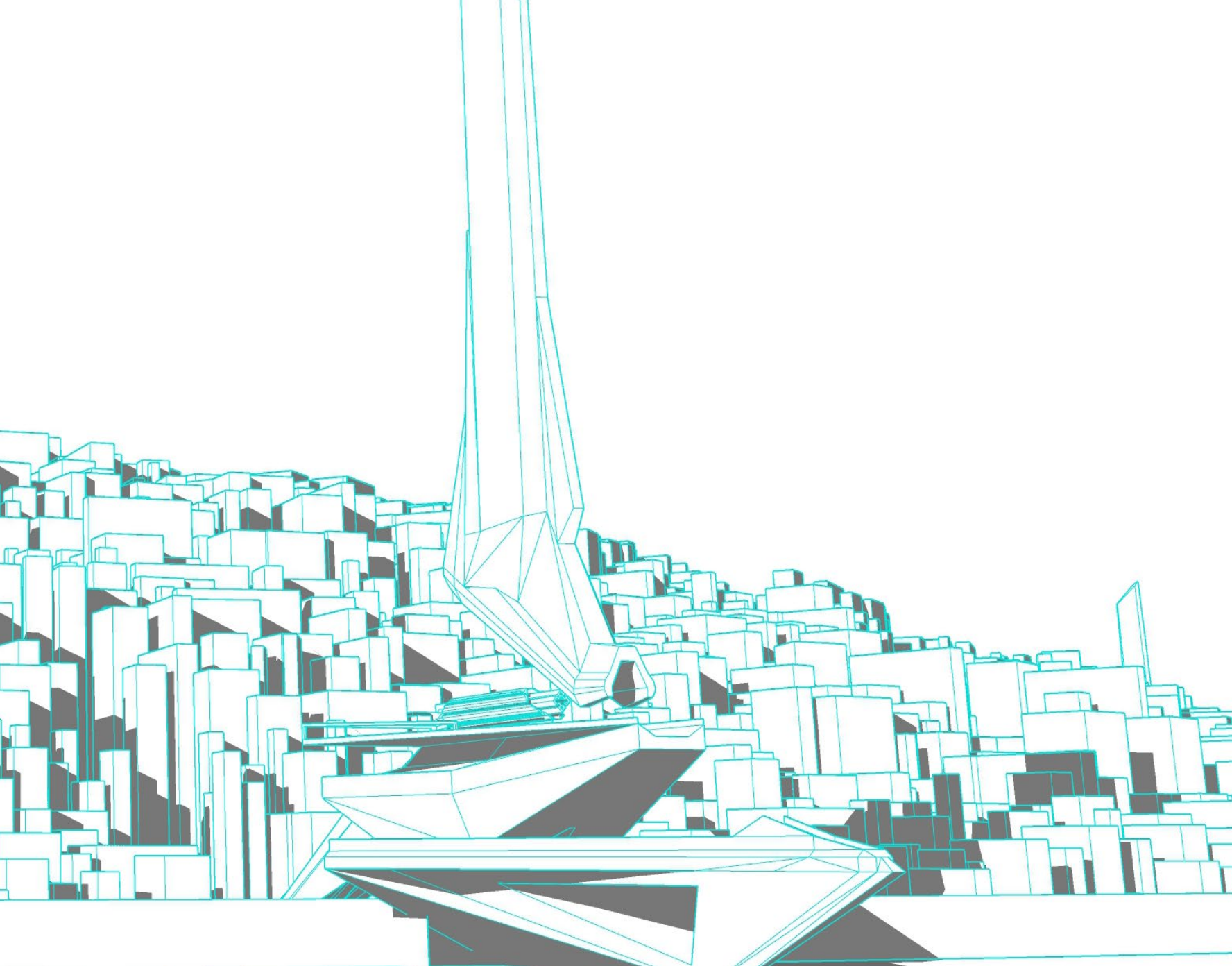




Speaking about how every city can create massive amounts of energy and how we use that to power the city and release the rest into the surrounding areas. This is all thanks to the main towers that are located at the center of every city. To this day, I'm not sure as to how the "Core" can create so much energy that we have an excess amount of it. From what I understand, they found this substance while colonizing Mars and recognized its potential for creating energy. In any case, we now use this energy from the tower to power each of the cities, supply power to the energy dome, and allows the spires to function as they should.

Its amazing the advances that science has taken in order to save humankind from extinction. I am thankful for all the genius minds that took the first steps to create these marvelous words of engineering. If the general population only listen to them in the first place..... maybe we could have avoided all of this.





Conclusion

Storytelling has been at the forefront of every civilization. Like it has in the past, it is looking to evolve one more time with the addition of virtual reality and augmented reality. Architects are posed to be in a wonderful spot in which they can begin to stretch their imagination without the limiting factors of physics or monetary value. We can bring to life buildings of past days or create those of future years. The only factor that we have to consider is how far our imagination can go.

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