For this year’s ONSITE, the theme ‘different’ unifies our exploration of various design mediums. What does it mean to be different, in the context of design, architecture and the city? The condition of difference (i.e. not the same, distinct, separate) can be physical, as well as conceptual, intellectual, political and/or virtual; private as well as public. Difference emerges from the act of delineating boundaries; on dissent; opposition; contention. Is difference a condition to aspire to, or to resist? Does difference create tension, breaks, or disorder within existing norms and conventions? How can an exploration of difference help us re-evaluate the environment or actions around us?

Ranging from product design to installation art, the articles are organized to facilitate a wide spectrum of questions on multiple sites and scales. Each author approached his or her respective area of interest through a critical lens in which differences in time, exhibition, medium, context, or purpose were brought into question, allowing every topic to be understood more critically.

We hope this publication leads you to use the lens of difference to become an active reader, user and participant.
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The light bulb is a commodity that many people take for granted. It is something that is present almost everywhere we go, but it is considered trivial in comparison to the many obstacles we face in life. Yet the light bulb, whether we realize it or not, is vital for everyday interactions—it has the important function of shedding light.

In terms of product innovation, there has been minimal change to the physical design of the light bulb since its introduction in 1879. The question then arises: if a company does not plan on creating new lighting technology, how do they differentiate themselves from an industry that does not necessarily require diversity in terms of aesthetic? And, what does it mean to challenge an uncontested design? Hulger, a British company formed in 2005 by Michael-Georg Hemus and Nicolas Roope, answers the questions just posed.

Hemus and Roope get inspiration from what they see as defects in existing items. With low energy light bulbs, they saw not the technology, but the design as a defect, commenting on its “dull regular shape” (Plumen). In addition, Hemus and Roope stress the importance of light. To them, “light is the fundamental precondition for reproducing shape and color and for creating atmosphere” (Lightyears). They believe that light should be cherished and beautifully presented and hope for people to cherish and celebrate light once more.

As a result, Hulger launched the Plumen project in 2007. The Plumen project is an alternative design concept challenging the lack of diversity in low energy light bulbs. The project proposes that, by making an aesthetically different light bulb design, people would be more likely to buy and use energy efficient light bulbs.

As with any product innovation, the path to success is a process—multiple steps and measures need to be taken to reach an end goal. For Hulger, the first step was to come up with a radically different design than the existing generic spring-shaped design of the compact fluorescent lamp (CFL) bulb.

After completing their initial design, Hulger was able to get their first Plumen concept and working prototype of the CFL.
bulb featured in many prominent establishments. These establishments include the Museum of Modern Art (MoMA), The Victoria and Albert Museum, The Smithsonian Cooper-Hewit Collection, The Art Institute of Chicago, and the Design Museum in Helsinki. The implication of their light bulb being in art museums shows that their product is more than just an average object—it is a designer object. This is another aspect that differentiates Hulger’s CFL bulb from the standard CFL bulbs. As one can see, even before the launch of their finished product, Hulger was not only able to market their Plumen bulb by differentiating it from what is already on the market, but they were also able to get publicity and to raise awareness of their product.

Yet despite creating awareness, Hulger faced the challenge of getting their Plumen bulbs into production, which suggests that innovation and awareness alone are not enough for success. Typically, manufacturers in the light bulb industry show little to no interest in changing their production line, as light bulbs are already sold in high volumes. As a commodity, the light bulb is valued more for its functionality than for its design aesthetics. Adaman and confident about their product, Hulger was ultimately able to partner with a large scale European manufacturer.

Unsurprisingly, Hulger faced yet another challenge—design, again. In order for their light bulb to come into fruition, Hulger had to adapt their existing design to be practical and cost effective in terms of production. At this stage, however, Hulger needed someone who understood the 3D industrial processes. By adapting the already existing CFL manufacturing process, Hulger was able to invent and create an aesthetically different low energy light bulb in collaboration with their designer, Samuel Wilkinson. Wilkinson states, “The big question was would we be able to physically produce it or not in the factory because there was no existing process...I looked at the filaments of old light bulbs and other forms trying to understand how the lines in space could work using the twisting concept. From there we started to talk with the supplier about how it could be made” (D&AD). The challenges were numerous: the working process of the production line limited the twists that could be used, and the factory needed to get the bulb’s phosphorescence physically into the new twisting shapes of the tubes. Yet Wilkinson, in collaboration with the manufacturer, was able to create a viable product that was commercially possible.

With this, in 2010 Hulger finally launched the Plumen 001, the world’s first designer low energy light bulb. Hemus and Roope explain once again, “We have taken a familiar, existing design and transformed it. The energy efficient light bulb is now a desirable object to show and enjoy” (Light-years).

Today, the Plumen 001 is sold worldwide for $34.95 for either the 120V or the 230V. Hulger claims affordability as a notable aspect of their bulbs. They state, “We strive to keep prices competitive and make our designs available through...as many stores as we can. By balancing efficiency and design with practical realities, we bring desirable energy efficient bulbs to a wider audience.” Despite their statement, similar CFL bulbs range from $2.19 to $13.97 at Home Depot. In addition, those CFL bulbs are said to last 10,000 hours, whereas the life expectancy of the Plumen 001 is 8,000 hours. Is it valid of Hulger to regard this as competitive pricing? Are their bulbs meant for a specific crowd of buyers?

The Plumen 001, however, is not the only light bulb that Hulger has come out with. In 2014, Hulger came out with the Plumen 002. The reality is that sustainable technologies are initially more...
expensive, whether it is the price of the product or the initial cost of the production. So, how is it that new companies get funding for production?

One tactic for Hulger was to use a website called Kickstarter for their second Plumen light bulb. In essence, Kickstarter is a global crowd-funding platform for a plethora of projects under fifteen categories, including, but not limited to: art, design, fashion, film, and technology. People who back Kickstarter projects are offered incentives for their pledges. Hulger offered a simple recognition of thanks on their website for a donation of $1 and promised to ship one of the first Plumen 002 light bulbs with a donation of over $30 and four Plumen 002 light bulbs and four copper pendants with a donation of over $225. With this, Hulger was able to raise $59,376 from 617 backers—$39,376 over their initial goal of $20,000.

There are many benefits for Hulger to put their project on Kickstarter. First, over 7.5 million people have backed a Kickstarter project. Because of this, Hulger was able to publicize their project and gain support and following for their future endeavors on a website with millions of followers and viewers. Second, those that view Hulger’s project on Kickstarter get a transparent dialogue with the company. Hulger gives a start-to-finish explanation of their project, including, but not limited to, the design process, future endeavors, critiques, risks, and challenges. In doing so, Hulger is able to earn voluntary help while marketing their product.

Ultimately, there are many aspects of the company and its short history that shows what it takes for an innovation to become reality. By challenging the untested design of a compact fluorescent lamp bulb, Hulger was able to put into market an aesthetically different, designer light bulb—a feat that no one up until this point had accomplished. Not only were they able to differentiate their product in this manner, but they were also able to differentiate themselves as a company through means such as Kickstarter. From conceptual desires of elevating one’s experience of light to a desire to make new technologies more accessible, Hulger, as a company, has made strides in the industry of light.
Walk into any New York City nightclub in 2014 and you will spot at least a couple of kids donning Nike or Adidas athletic wear. The trend has extended beyond wearing a logo on a t-shirt, but involves dressing for the club as if you were going to the gym. Polyester is a popular material in Nike and Adidas’s designs because of its breathability and reflective qualities. However, the function of sportswear in the club extends beyond its practical use value and reveals an aspirational aesthetic. This trend coincides with an international wave of designers that engage with a difference between functional sportswear and the cultural associations that surround mega-brands such as Nike. Smaller brands such as Dettok and Cottweiler use this difference to establish themselves at a higher price point than Nike and Adidas but appropriate similar materials and silhouettes in their construction.

The designers behind the luxury sportswear brands Dettok and Cottweiler are most likely in communication with one another, as their logo and website designs are strikingly similar. Both company logos are formed from the “double t” (TT) symbol in their brand name. Their use of a triple stripe on the top left corner of the window, with the name stamp above, is consistent across the two brands. The italic Dettok logo suggests motion in its tilt, compared to the upright “TT” of Cottweiler.

Cottweiler’s aesthetic is marked by differentiation of material while maintaining a limited color palette. Their website showcases the Fall Winter 2014 collection through a scrolling mechanic that sweeps each look from left to right.

Cottweiler is a British menswear brand that responds instinctively to its social environment. Forward-thinking design and manufacturing is combined with an aspirational quality to form a relevant, concept-led menswear label.

Sam Stevens
The clothing itself is grayscale, while the human form is coated in a terra cotta texture with touches of red hair and muted lavender in the flat background. This restriction of color range allows for clarity of material content across garments. The first piece is a semi-transparent polyester tracksuit. The outer layer is white and veils a black structure underneath. The different combinations of the two component layers through an unpredictable folding on the human body creates a range of color between white and black. Opaque polyester striping is added above the knees and along the side contour of the body. The later pieces in the collection explore a non-transparent materiality, with black cotton sweatpants and a memory taffeta raincoat. Cottweiler’s earlier Spring Summer 2014 collection pushes a white transparent material to an extreme. A full body white tracksuit with only a single polyester layer reveals the human skin underneath. It is clear that Cottweiler emphasizes the transparency of the polyester, as they demonstrate the optical qualities by photographing a sheet against a forest floor. The green form of the leaves renders through the fabric, concealed only by the reflection of natural sunlight. An adjacent image shows a translucent water bottle in the pocket of the tracksuit. One of the more powerful images in the collection shows a parkour athlete backflipping, with no apparent ground plane in the frame. He appears floating in the air, and a motion blur renders the polyester liquid around a clearly defined human form. This imagery surrounding Cottweiler’s campaign suggests that their line of sportswear is a liquid medium between the human and his/her natural environment, rather than a protection or boundary against surrounding conditions. They value transparency in their clothing because it emphasizes an ideal constraint in the design of sportswear, that of adherence to a human form.

Dettok’s presentation of transparent elements in sportswear is static but equally potent.
is static but equally potent. The structure of their website is visually similar to Cottweiler’s in the arrangement on the homepage, but the view of seasonal collections is stationary rather than dynamic. The looks are arranged in a grid where the user can highlight a garment of choice as the photograph turns less opaque. The Spring Summer ’14 collection uses elements of striping and warm-up suits, but the focal point of the collection is the Invader Sweat. The garment comes in three different color-ways, as a polyester crew neck with transparent striping. The composition of the Invader Sweat is a direct opposite to Cottweiler’s transparent tracksuit; the garment is opaque while the striping is translucent.

Another difference between the two brands’ presentations of the clothing is the posture of the models. Dettok’s models stand still in front of a white background. In all of the images, both feet are planted on the ground, establishing the body as stationary. Many of Cottweiler’s models are in motion, which gives the material a different optical character through motion blur. Although Dettok’s clothing is relatively static, their silhouettes are rooted in activewear. Nike and Adidas pioneered the striping motif, developing the symbolic cue for sportswear and tracksuits. Dettok subverts the athletic striping on the surface of the body and extends it to straps that hang over the clothes. From afar the visual effect is the same between a surface stripe and strap, but the strap is able to modulate the tightness of the garment to alter the silhouette.

While Dettok appropriates the aesthetic tracksuit to evoke a lifestyle of luxury, Cottweiler’s tracksuit is reliant on the optical characteristics of the surrounding environment. Dettok uses fully opaque polyester that glints under low light, with marks of transparent striping that resemble jewelry. The website provides detail photographs of the garment against a flattened white backdrop, much like a painting is displayed against a gallery wall. Detail photographs of Cottweiler’s garments are absent from their website and only present from third party distributors such as Farfetch and GR8. They are heavily reliant on a surrounding environment and secondary imagery on their Tumblr page photoshoots.

The juxtaposition of organic material against translucent fabrics is pervasive in their visual marketing. The Spring Summer (SS) 2014 collection is shot entirely in a woodland environment, while the SS ’15 collection uses collateral marketing to push imagery of sunbathing, poolside lounging, and marine technology. The company’s mission statement claims the brand “responds instinctively to its social environment.” For Cottweiler, the natural world gives their clothing a distinct visual character.

Dettok’s use of transparency lies in polyester’s aesthetic versatility. The Invader Sweat is mostly opaque, insulating, and reflective, while liquid, transparent elements stripe around the main structure of the garment. Dettok’s tracksuit is not meant to be worn during workout, but instead engages with a purely aspirational mode of sportswear culture. Their clothing suggests that contemporary sportswear has become an established genre - an aesthetic that permeates fashion in every manifestation. The notion of “sportswear” has become abstracted from its tie to athletics and is now a set of visual tropes that designers can engage with to express their unique vision.

There are many techniques that fashion companies use to establish themselves as “luxury,” including superior design quality, limited accessibility on the market, and branding of a lifestyle that extends beyond clothing. The landscape of luxury clothing is changing rapidly, as designers are pushing the theme of sportswear and repositioning its role in the fashion world. Designers are beginning to abstract the motifs of internationally established brands such as Nike and Adidas in order to build luxury brands with a new vernacular. Companies such as Prada and Louis Vuitton are engaging with this phenomenon already, juxtaposing formal wear with running trainers on the runway. A difference between luxury wear and sportswear is starting to melt away, as the two fields become merged into one.

Suggested brands to explore: Astrid Andersen, Nasir Mazhar, VFILES Sport Plus, Adidas by Rick Owens, Adidas by Raf Simons, Acronym
Large-scale advertisements are an omnipresent element within the urban fabric. These unavoidable graphic messages are conceptually hazardous: both their location and effect on their viewers have been carefully planned, researched, and executed by the companies with the power to place them in areas of high activity and visibility. As viewers, we are consistently drawn to the familiar images that invade the urban fabric and are, as a result, left powerless.

This invasion of the advertising world is the result of a marketing strategy based on the “cultivation theory”, developed by Professor George Gerbner, Dean of the School of Communications at the University of Pennsylvania. Gerbner proposed that mass media sources could lead people to perceive the real world in ways that reflect the most common and repetitive messages and lessons provided by such mass media outlets. This theory manifests itself in modern advertising strategies, as companies seek to target a specific group of people and repeat imagery in order to engrave an ideology in viewers’ minds. The viewers repeatedly absorb the images until they associate them with a reflection of what reality is, or should be.

An important targeted group to consider is women, as they are both the viewers and subject matter of one of the more powerful advertising industries of all: the fashion industry. The fashion industry utilizes the “cultivation theory” in order to construct an image of what a woman is, or should be. Casting directors curate the airbrushed faces in magazines, billboards, and commercials, and the women become contenders in an unrealistic and deadly beauty contest. It is impossible for all women to identify with these faces, yet the media and consumer culture somehow impose their presence upon women to form a skewed representation of identity.
Croatian photographer and installation artist, Sanja Ivekovic explores this threat to female identity in her photography series, “Women’s House (Sunglasses).” The series, which Ivekovic began in 1995 and finished in 2009, features appropriated images from high fashion sunglasses advertisements for elite brands such as Prada and Dolce and Gabbana, which have been layered with texts in order to alter the viewer’s perception of the ads entirely. The texts detail factual, first person accounts of sixteen Eastern European women who were victims of domestic abuse and found refuge at the Women’s Autonomous House, the first shelter for women in Zagreb, Croatia.²

A comparison to Andy Warhol’s iconic “Marilyn Monroe Diptych” allows us to understand the subversive nature of Ivekovic’s activism. Warhol’s piece elevates Marilyn’s status into that of a cultural icon to reflect on the cult of celebrity and glamour that was prevalent within Warhol’s lifetime. The 1962 pop art piece causes us to question, reflect, and become increasingly aware of the popular culture, but it certainly doesn’t seem to be manipulating the meaning of the images as Ivekovic’s piece does.

Ivekovic goes further than appropriation: she manipulates the mass mediated forms of culture to critique and expose ideology and re-articulate meaning. Rosalind Krauss uses the term “discursive spaces” in her essay “Photography’s Discursive Spaces: Landscape/View,” meaning that “photographs can belong to two separate domains of culture, assume different expectations in the user of the image, and convey two distinct kinds of knowledge.”²

Ivekovic’s piece, “Women’s House (Sunglasses)” creates a revolutionary combination of two such “discursive spaces”: mass media advertisements of consumer culture are brought into the space of female activism and women’s rights awareness through the addition of text. This combination of two different spaces creates a commentary on society’s awareness towards abused women in comparison to its awareness of high fashion models.

The piece looks deceptively similar to the original fashion advertisement as Ivekovic intentionally preserves the conventions of consumer culture.

Each glossy, black-and-white inkjet print within the series of sixteen prints is blown up to be four feet tall and three feet wide. As a result, the piece has a strong visual impact in the same way that
large-scale advertisements do and is immediately recognizable as a fashion advertisement. This moment of recognition is crucial to the piece as it allows Ivekovic to subvert the assumptions implied in the discourse of mass media using its own visual language.

When I saw this piece at the Frieze Art fair in May of 2014, I was attracted to the piece from afar by the familiar advertisements which I associated with positive connotations: luxury, glamour, and style. However, after reading the horrifying texts accompanying the pictures, I was forced to reconsider my initial reaction. This moment of reflection demonstrates the effectiveness and urgency of the piece. I felt the need to question why I felt so drawn to the fashion advertisements in the first place. Is the amount of attention the models in high fashion advertisements receive justifiable, considering the urgent need for the awareness towards these “other” women, who frequently wear sunglasses to conceal their black eyes?

Ivekovic’s piece challenges this condition by tricking the viewer into being drawn from the “discursive space” of mass media advertisement into this unknown, terrifying space.

Ivekovic’s decision to explore this terrifying space and collaborate with the Federation for Women and Family Planning of Croatia arose from the fact that violence against women was a hidden issue in her own country. The first women’s shelter in Croatia was built in 1989. Ivekovic visited the shelter and met women there in order to better understand the hidden world and increase awareness towards the issue in a compelling way. The factual narratives that Ivekovic presents are a necessary starting point as they create a powerful message towards activism in defense of these women.

Can pop culture ever shift its focus from the woman in the image to the “invisible” women in the text?

This question is difficult to

These “other” women, whose accounts are presented in the piece, are certainly not the stars of our popular culture. In fact, they are often shunned, forgotten, socially isolated, and disregarded.

Figure 4: Photshopped Mosaic of “Firuze”
answer considering the fact that Ivkovic’s visual argument remains in the gallery space, whilst the mass media advertisements invade the urban fabric through countless mediums at a larger scale. The next step forward must be to challenge the established pop culture by forcing the public to realize that the real superheroes of our culture are the sixteen women in the narrative, not the faces of the advertisements. In creating a powerful moment of puzzlement, however, Ivkovic’s piece represents a large step in shifting the mentality of popular culture. If we can acknowledge the effect of these advertisements through Ivkovic’s subversion of the mass media visual language, we can come closer towards transforming it.

There are over 20,000 plastic flowers whose LED lighting illuminate the roof of the Dongdaemun Design Plaza (DDP) in Seoul, South Korea. Each flower is three feet in height and designed to resemble a perfect rose in full bloom. The image on the right, published by National Geographic, is that of a woman making her way through this garden. She is captured brushing aside the flawless fabricated roses to make way for herself just as one would with a real plant of that height. It is the way this woman interacts with the flowers that I find striking, as if there were no difference between plastic objects and organic phenomena. She engages the space just as one would expect her to in a field of wild flowers. It’s quite impressive that humans can manufacture forms of nature and create a space that can be engaged as if it were an organic landscape, but there is something unnerving about the situation as well. The woman knows she is moving through a constructed space, but she acts no differently. What does this say about the difference between nature and its artificial constructs?

The duality of man and nature is a recurring and relatable notion in many forms of media and art. It is particularly so because humans, as an entity, are one of the subjects. The concept of this pair is likely to have originated from the Enlightenment era when ideas of reason, extreme analysis, and individualism were new and provoking. More recently, with the introduction of this concept into popular cultural thought, a discussion was opened that would escalate the issue into
one of greater controversy. In this way, it created a divide between human life and what exists as nature. This division seems ironic as humans are very much a part of nature, but we become the opponent when our creations become too close to nature in a way that might alter how we perceive its effortless formations. Keeping this in mind, I explore two different design projects, the DDP center in Seoul and the Supertree Grove in Singapore’s Gardens by the Bay, that evoke the forms and functions of nature.

The focus of my analysis is on the aesthetic value of nature, referring to redeeming qualities of landscapes, natural objects, and spaces for the impressions they have on us, as well as its processes that create and sustain life. We tend to find beauty in nature as it exists on its own. Its forms, colors, and auras affect us like nothing else. The chastity of organic forms has a purifying effect that we often crave. Humans were created from the same extraordinary dirt that nestles fallen autumn leaves and sprouts daisies in the spring. If the real thing is as effective as it is effortless, how can we justify mimicking nature with industrial materials -- spending millions to reinterpret a form so pure that nothing else that is exactly the same exists? These installations are enchanting in that they glorify the most appealing aspects of nature, but there needs to be a clear understanding of the difference between real and fake. Constructed abstractions of nature cannot have the same purifying effect as the real thing.

The DDP was designed by Zaha Hadid and opened to the public in March of 2014. Zaha introduces design elements that appear “neo-futuristic” for their sleekness and flowing forms. This complex acts as a space for art, culture, and shopping. According to a USA Today article released after the building’s opening, the center is a showcase celebrating both Korean culture and Zaha’s design skills. As a space where trends are meant to be set, the article notes that the DDP Center has already been considered “an early arrival of the future.” The context of the installation is busy, both in terms of its social functions and its design elements. This hardly seems like the space for appreciating nature. The plastic flowers are enchanting and add to the futuristic elements already present in the DDP, but they cannot be regarded with the same reverence as the real thing. The exhibition was installed by the DDP in accordance with the release event for the rising OMEGA luxury watch brand. As an addition to this event, the “enchanted garden” installation solidifies its role as a modernized abstraction of organic forms, from which it is far removed.

The plastic flowers are a relatively simple installation in that all...
of the flowers are the same and their main feature is that they light up at night. The woman pictured by National Geographic attempts to use the space as if it were a natural space. The simplicity of the constructed forms lead the scene toward something slightly convincing, but to no definite effect.

What happens when we explore a more complex project that attempts to mimic nature not only in its forms, but also in its functions? Are the actual differences more apparent, or is it possible for humans to construct a space of industrial materials that successfully mimics nature in aesthetics, function, and the way we interact with it?

A more complex project involving artificial constructions of nature is the Gardens by the Bay Park in Singapore, particularly the Supertrees Grove. The Gardens were the result of an international design competition and opened to the public in 2011. They are an attraction for both leisure and for hosting major cultural events. Along with the actual nature preserved in the gardens, the whole complex is filled with installations of artificial representations of nature that are designed to imitate the real thing in both form and function. There are many branches of the park including Cloud Forest, Dragonfly Lake, and Flower Dome. The attraction I find most striking, however, is the Supertree Grove. The artificial trees reach up to sixteen stories in height and are placed in clusters of three around the area.

These trees are comprised of four major parts: a core made of reinforced concrete, a steel frame attached around the core, planting panels for the “living skin,” and a funnel-shaped canopy reinforced by a hydraulic jack system. The “living skin” refers to the 200 species and varieties of bromeliads, orchids, ferns and tropical flowering climbers that are planted in the eighteen Supertrees.

The Supertrees also have qualities that evoke the functions of nature and are considered “environmentally-friendly.” Some trees have photovoltaic cells that harvest solar energy for lighting, while others are integrated with the cooled conservatories and serve as air exhaust receptacles. The Supertrees are intriguing in both their function and design, but why are they designed to mimic the form of trees? What is the point of imitating nature?

What does this say about nature and its artificial constructs?
According to an article by Rachel Sullivan entitled "Save or recreate? Lessons from Singapore on the value of green spaces" the Supertree garden was inspired by the Karri Forest in southern Washington State, which is one of the tallest hardwood forests in the world. Since Singapore is a completely urbanized city-state, their space for raw nature is extremely limited. The Supertree Grove is a product of the “City in a Garden” initiative, which is pushing Singapore to hold its position as Asia’s most environmentally-sustainable city. The CEO of Singapore’s National Parks Department explains that the initiative and the Supertree project is meant to “mitigate against the harsh urban environment as Singapore developed, improve the quality of life for Singaporeans, and remind investors that Singapore was a place where things worked” (Sullivan). Of all the reasons for this project, the first he mentions is one of bandaging a highly-urbanized area with remnants of nature. And that this park can claim to be, in terms of its similarities to the towering Karri trees. The Supertree structures are an enchanting rendition of the glorifiable aspects of the natural form, but they are ultimately an abstraction. An abstraction of nature cannot compare to the forms and functions of the real thing.

In considering these two projects, the LED-lit plastic flower garden behind the DDP in Seoul and the Supertree Grove in Singapore, I am struck by questions of the future of these constructed representations of nature. Is there some sort of new precedent set for what a “garden” can be? These two projects have presented cases in which large-scale developments have attempted to mimic organic forms in form and function. These creations are impressive and enchanting, but the abstract construction of their designs cannot compare to the purity of Mother Nature.
The quiet shuffling of feet, the murmured sound of conversation and the looming feeling of the security guard in the corner watching your every move can make for a less than desirable experience when visiting an art museum. Whether visiting a museum with ancient works or one with more contemporary pieces, rules like no touching, no flash photography, no stepping beyond a certain boundary, etc. make for a very scripted experience. The modern museum prioritizes the art over the physical experience of the viewer, but what happens when the physical experience becomes the art?

With its roots starting with certain artists in the 1960s, installation art strives to provide a full bodily experience that more traditional art forms cannot provide. Artists like Marcel Duchamp, Allan Kaprow, and more recently Maurizio Bolognini, Ernesto Neto and Pinaree Sanpitak, attempt to make art more accessible and engaging to its users.

Installation art, in its broadest sense, is applied to a range of art practices that involve the installation or configuration of objects in a space. While its roots are typically associated with certain artists starting in the 1960s, early examples of installation art can be traced as early as 1917 with Marcel Duchamp and his series of readymades (Gayford, 2008). Perhaps Duchamp’s most famous piece is Fountain. Fountain consists of a standard urinal that Duchamp purchased from a hardware store, signed ‘R Mutt 1917’ and displayed on a pedestal at a gallery. Duchamp belonged to an art movement called ‘Dada’ whose members sought to challenge convention and to change the view of what can and cannot be considered as art. The piece was considered very scandalous during the time period and received many mixed reviews. Newspaper reports at the time deemed the word ‘urinal’ offensive and referred to it instead as a ‘bathroom appliance’. Artists, such as the realist painter George Bellows, declared the work as ‘indecent’. The exhibition that hosted Fountain decided to show the piece hidden by a screen (Gayford, 2008). While it may not seem so shocking for today’s standards, Fountain was
an incredibly important work in the 20th century. It changed people's perceptions of art, which is what installation art attempts to do several years later. Because of Fountain, people were able to appreciate the thinking behind an artwork and to break free from what was common of the time, i.e. portrait and landscape paintings hung on a wall, and to accept the unfamiliar. Duchamp influenced people to rethink what defines art in the context of the museum.

Evolving from everyday objects into entire rooms and spaces being used as art, Allan Kaprow headed this transformation of an art form in the 1960s. He is known as the inventor of the Happenings, a term he coined in 1958, and for working with art installations (Kelley, 2005). In 1962, Kaprow first realized his installation “Words”. “Words” was comprised of two small rooms built in the Smolin Gallery in New York City. The first room was covered randomly with words that were hand lettered on pieces of paper or stenciled on rolls of canvas. Users could read the words in any order or direction and even add their own words to the list. Three record players of words recited by Kaprow were played and red and white light bulbs flashed on and off along the tops of the walls. The walls of the other room were dark blue and covered with graffiti. Colored chalk, hung from strings and allowed visitors to draw pictures and write messages. The space was filled with strips torn from bed sheets and suspended from the ceiling, each clipped with a blank piece of paper that could be written on. The floor featured a phonograph that played whispers that could only be heard by kneeling down (Kelley, 2005). The people entering into the rooms were deluged by the sounds, but were able to actively engage with the space by writing on the walls or on the torn bed sheets. Kaprow and “Words” allowed participants to act in the present moment of the art. Through the concept of using language as a form of environment, “Words” permitted an unpredictable experience that was constantly changing all due to the engagement of the users. The art could take on new forms that were defined by the people engaging with it.

With the emergence of new technologies in the recent decades, installation art has flourished because of its almost limitless possibilities in terms of its use and display. In 1988, Maurizio Bolognini, a post-conceptual media artist, began using personal computers to generate flows of continuously expanding random images. In the 1990s, he programmed hundreds of these computers and let them run in the same way for as long as they could. In 2000, he began to connect some of these computers to the mobile phone network, which he called Collective Intelligence Machines. CIMs enabled him to make interactive and multiple installations,
Connecting various geographically distant locations. The flows of images were made visible by large-scale video projections and users were able to modify their characteristics in real time. The CIMs generated flows of images, which were projected onto large buildings in public spaces and could be changed by anyone sending new input from their mobile phone to the installation (Smith, 2012). Bolognini provides an example of how technology has allowed for new ways of engagement with the installation. The experience of the artwork is defined by the engagement of the users rather than the artist himself.

The use of technology in installation art in the modern world is not always characterized by the use of mobile devices or computers. The human body can be the one interacting with the technology as well. In her piece in the 18th Biennale of Sydney, Bangkok-based artist, Pinaree Sanpitak incorporated the use of fiber optics to respond to the movements of the audience. Entitled ‘Anything Can Break’, the installation consisted of a series of arches, which were covered by translucent fabric and set up in a labyrinth of walkways and rooms. Visitors were invited to step inside the sculpture and to smell the stalactites that were made up of spices including turmeric, clove, ginger, black pepper and cumin. The smells infused into the environment and heightened the sensorial experience. Users were also encouraged to actively engage with the artwork and with each other through the skin or the fabric of the sculpture (John-son, 2009). “When I do a large work like that, I think about how to put humanity in it.” The whole anthropodino idea considers the human being in a scientific way, not only as an individual or as a part of society, but in the sense of an organ. In society, the human being must be an organ or cell. So this is a cell. The drawing of this piece depicts a cellular structure - mytochondria with ribosomes and membranes. This piece acts as a center of energy for the people who move around it,” commented Neto on ‘Anthropodino’.

Installation art is an exciting art form because it breaks free from a single perspective. Users are encouraged to interact and to engage with the art from different perspectives rather than to just stand in front of a piece of art in a museum setting. With many installations, viewers are able to walk in, around and even underneath the artwork. This experience is extremely different from more conventional art forms because it provides a multiperspectival experience. This experience can also act as a multi-
Mechanical reproduction has always required that the human subject act as mediator and interpreter of the process of reproduction itself. For instance, photographs are printed according to the specific visual characteristics desired by the photographer. As Peter Eisenman suggested, “the photograph can be said to remain in the control of human vision.”¹

Electronic media, on the other hand, is not subject to human intervention or interpretation in the same way. Rather, electronic media contains processes of mediation that are hidden from the user and controlled by the internal wirings of an entirely other logic – that of the digital. Eisenman asserts that this removes the human discursive function from the process of production and therefore places it outside the control of human vision. By vision, Eisenman means the process linking “seeing to thinking, the eye to the mind”² that perpetually aligns the production of content with the desires of an anthropomorphic subject.

Since it does not pass through the intermediary of human vision, electronic media is capable of disrupting how we experience reality itself: “For reality always demanded that our vision be interpretive.”³

In his art installations, Danish-Icelandic artist and architect Olafur Eliasson explores the idea of motion, interaction, experience, perception and self-awareness. His works use various media and technologies to create new experiences for his viewers. Each individual viewer’s movement through the installation activates a new experience, without the intervention of the designer.

One of his well-known installations is the Weather Project that took place in the Turbine Hall at Tate Museum, London, in 2003.
The installation consisted of a giant artificial sun made from thousands of yellow monofrequency lights, located in the front of the interior of the hall, and a ceiling of mirrors with mist coming out from both sides of the walls (see Figure 2). Through this indoor installation of artificially-controlled weather, the artist attempted to imitate - and to comment on - the London weather. Group after group, millions of people came to enjoy the warmth of this constructed indoor climate.

People talk about weather as a continual subject, yet it is one of the only things that is completely out of our human control and can never be predicted with certainty. For many city dwellers, the weather is the closest insight they could get to nature. As Eliasson comments, “over the centuries, defending ourselves from the weather has proven more important than defending ourselves from war and violence. If you cannot withstand weather, you cannot survive.”

Among the English people, weather is an ubiquitous subject in conversation. People usually greet each other by commenting about the weather that day and then go on to talk about other things in London. As Samuel Johnson jokes, “it is commonly observed, that when two Englishmen meet, their first talk is of the weather; they are in haste to tell each other what each other must have already known, that it is hot or cold, bright or cloudy, windy or calm.” Eliasson’s project comments on the fundamental impact of nature on culture and society.

The Weather Project sets up an interesting tension between nature and the built environment. The structure embedded with technology was presented in a humble way that allowed visitors to understand what they were seeing and experiencing. The engagement with the interior space of the exhibition, mediated by the installation, completely ignited the imagination of the viewers.

Eliasson’s comments on the incomprehensible nature of the weather by emphasizing the fundamental act of perceiving the world around us. Moreover, the Weather Project also reminds us that, as technology continues to enhance our life, the concept of nature is also being redefined by that very technology.

“..It enables the viewer to understand the experience itself as a construction and so, to a higher extent, allow them to question and evaluate the impact this experience has on them.” (Olafur Eliasson)
Another installation, *Take Your Time* consisted of a huge, tilted disc-shaped mirror of 40 feet in diameter that was mounted on the ceiling of the largest gallery at MoMa P.S.1 in Queens, New York. The mirror was suspended horizontally from the gallery ceiling. Because the mirror was tilted slightly, the viewers felt as if the mirror was rotating slowly, with a subtly undulating movement that caused the room itself to seem warped and unstable as they walked around in loops below the mirror.

Many viewers immediately dove to the floor and looked up at themselves in the mirror. Because of the interestingly positioned mirror, the viewers realized the view was changing. Therefore, their brains remained alert and interested. The mirror caused an illusion: the viewers felt that they were not actually seeing themselves but rather suspended on a vertical wall. They experienced this as much with their sense of balance as with their eyes.

In this project, Eliasson explored perception and space. The viewers did not stand in front of his work as if they were standing before a painting. Rather, the tilted mirror destabilized the viewers’ perception, tricking them into thinking that they were inside the artwork. The motion of their bodies underneath the mirror was actively engaged in the reflection.

As part of the larger exhibition, this installation created a unique social experience by drawing attention to the very act of looking. Just like the *Weather Project*, the movement of the viewers was connected and mediated by the tilted mirror. By involving the viewers as part of the exhibition, they were given the agency to create and modify their experience in a unique way.
FIGURE 9
"Museum is your observatory"
Photo: Studio Olafur Eliasson
personal experience.

Similarly to the Weather Project and the tilted mirror at MoMa P.S.1, Olafur Eliasson’s *Multiple Shadow House* was another installation that centered on the viewer’s individual experience.

Exhibited at Tanya Bonakdar Gallery in New York in 2010, the installation consisted of a series of rooms. Within each room, there was a large wooden framework that supported large projection screens. The screens were lit up by a bank of lights. The lights varied in colors: red, blue, green and so on. As individual colored lights were projected on the screen, they blended into white lights and intersected.

As the viewers stood in front of projected light, their bodies fragmented the lights into split-colored shadow overlays of their own figures onto the wall. When viewers moved, the colored shadows and lights played along with the body movement like rhythms that were constantly altered and manipulated. Like in other installations by Eliasson, the viewers were in complete control over the patterns of shadows. Their movements in the room created new patterns of lights. As multiple viewers overlapped and interacted, the spectacle of light became more complex. This work was a situation experienced as it was created.

These projections, like much of Eliasson’s work, involved the collaboration between the artist, the viewers, space and technology. The *Multiple Shadow House* raised the viewers’ awareness of the fundamental element of our environment, such as light and shadow. Like the *Weather Project*, Eliasson wanted people to be aware of the little things in the environment we live in. Little things like light and shadow are usually taken for granted as we proceed through the day doing our daily tasks. The *Multiple Shadow House* urged people to re-interpret these fundamental elements of every-day life with renewed appreciation.

Throughout his career, Eliasson has challenged the notion of the artwork as a static object. His provocative art installations explore the meaning and potential of basic elements in our daily life. Through an exchange between the artwork and the viewer, each individual activates and manipulates their personal experiences.

Unlike photographs, which are printed according to the photographer’s intentions, within Olafur Eliasson’s installations, technology allows each viewer to create his or her own interpretations.

“To track the sun is to track yourself.” (Olafur Eliasson)
Space is generally defined by the walls that enclose an expansive area; however, there is an additional element that adds to the presentation of space and its spatial qualities. It is the individual and his or her presence in any particular place. The individual works within the space in order to produce new spatial relationships. One example that produces a new relationship with nature is Ryue Nishizawa and Rei Naito’s Teshima Art Museum. Commissioned by Soichiro Fukutake, it is one of various projects for the 2010 Setouchi International Arts Festival, which aims to further develop Japan’s Setouchi Inland Sea as a cultural and creative hub. Currently, it is still open for visit.

Situated on a steep hillside on the Teshima Island, Japan, the art museum’s sleek yet subtle design looks like a droplet from an aerial view; yet it looks like another hill from the side view. The site contains a main building and a smaller, side building. The main building is intended to be a gallery space, while the smaller building is a café and sitting area. The project’s primary function is an art museum.

“"A thin concrete shell slab reaches as high as sixty meters, creating a large organic interior space. By making the ceiling lower than that of many shell structures, the architecture appears to be part of the external landscape, like a hill or a slope. Inside it has a space that stretches low and horizontal. There are large apertures on the surface of the shell to let in light, rain and the fresh air.” (Ryue Nishizawa)

Rei Naito’s Teshima Art Museum. Commissioned by Soichiro Fukutake, it is one of various projects for the 2010 Setouchi International Arts Festival, which aims to further develop Japan’s Setouchi Inland Sea as a cultural and creative hub. Currently, it is still open for visit.

However, the design of the building in the form of a droplet, combined with its water-based art installation, produce an experience for visitors that engages not only their visual senses but also their olfactory and auditory ones. Thus, the experience allows visitors to connect with both the cur-
rent art installation and with the surrounding environment.

The museum’s smooth structure blends with the landscape and creates a narrative which is itself an art piece. A passerby would not notice this building, unless he or she comes across the pathway which is covered by another hill. Once reaching a full view of the site, the museum shows no details or remnants of a supporting structure that represent the general outline of a typical building. Instead, the Teshima Art Museum has a shell that was created by continuously pouring concrete over a fabric formwork supported by a cable grid over a span of 22 hours. This means that there are no conventional windows and doorways; instead, there are holes carved out of the museum’s concrete shell.

These openings allow for the natural light to illuminate the space. In addition, the lack of a glass or any type of material separating the interior space from the exterior space exposes the visitors to all elements of nature such as rain, wind, and wildlife. Here, individuals are also in direct contact with the elements. They have the opportunity to interact with the natural environment while being seemingly protected by a structure. Framed by two main openings in the ceiling in the main gallery, natural light provides a gentle illumination of the space. As a result, the structure becomes another piece of the environment. It becomes another aspect of the landscape by providing a space for humans to inhabit, just as a tree or a cave would provide shelter for other living things.

Additionally, natural light does not depend on human control. There are no electric wires running from the within the walls to manage brightness intensity and, thus, visitors return to a somewhat primitive state. They become dependent on sunlight to see and experience their surroundings. So how would this affect the visitors perception of the space?

Upon entering the museum, the visitor is placed into this expansive space with no separation from the interior or exterior space because of the museum’s open layout. Thus, visitors experience space as a space in itself, instead of as a container. The Teshima Art Museum conveys this idea strongly since it does not contain paintings and drawings. The art piece on exhibit is simply the Teshima Art Museum and a subtle art installation by Rei Naito called “bokei”, which is roughly translated to “matrix”. His art installation features water seeping out from the floor, which brings about little springs or pools of water around the gallery space. The movements of the droplets are not controlled by any human creation but rather, they are guided by the winds that enter through the open windows and doorways. The unique characteristic of this installation is that it does not interfere with the design of the Teshima Art museum. It fully incorporates the surrounding landscape into the structure in a harmonious manner. It manipulates the human constructed space and reminds the audience that the space is still artificial; yet, the museum provides a place for people to interact with nature and it also encourages them to acknowledge the space around them. The museum becomes a place where its function is to allow its visitors to appreciate nature.

Additionally, the visitor is encouraged to experience the museum as a vast space with its thin, concrete boundary. There are no visual points of interest except for the ceiling, the walls, and the other people who are in the space. The visitor has the freedom to be wherever he or she would like to be -- whether under the open ceiling or under a roof. In other words, he or she can choose where they want to be in order to look and experience the space. There are no limitations. This is one positive
aspect of this experience. Visitors also have the potential to return to a natural, unmediated state. This means they do not have to be distracted by their own thoughts or by external devices. For some, this respite from technological society can be frustrating, but for others it provides a reset button. The experience becomes refreshing, and visitors have the opportunity to exit the museum with a clearer mind.

To add on to this experience, the Teshima Art Museum also creates a void with its natural light, its concrete material, and art installation. Since there is an emphasis on one art installation that is well-incorporated into the museum, visitors are only faced with one object in space - themselves. What they are supposed to do in this space and why become relevant questions. The design of the art museum becomes more profound, as visitors are seemingly forced to view themselves in that space and to experience how they affect the space around them. In this case, they are dealing with nature and their relationship with nature. The void creates a space where visitors can destress and reflect on their existence in that space.

Since the Teshima Art Museum’s space is only partially enclosed, it allows the visitor to exit and enter the space freely. The space becomes a place that they can call their own, as well as a space that is shared with nature and other people around them. As Ryue Nishizawa says, “the architecture aims to create a dynamic space that is both closed for the work of art and the environment and open at the same time. Our goal is to generate a fusion of the environment, art, and architecture, and we hope these three elements work together as a single entity.”

With the Teshima Art Museum, visitors are exposed to a different type of space that they would not necessarily be able to experience if they came from a different environment such as the city or suburban areas. The vastness of the space and its placement allow for visitors to experience a break from their busy lives and relax within the natural environment. The natural light plays a part in the full experience since it removes the jarring effects of artificial light and returns the visitors eyes to a state without technological or material distractions. The bokei art installation also adds to the experience by creating the interactive component to the art museum. It subtly suggests that the space is not simply the individual’s own space. The sporadic springs and pools of water move just as the visitors would in the space. They are both guided by some external force, whether it is the viewer’s will or the wind.

“It was important to us to create an architectural space that could coexist with Rei Naito’s work, and act in harmony with the island’s environment. We proposed an architectural design composed of free curves, echoing the shape of a water drop. Our idea was that the curved drop-like form would create a powerful architectural space in harmony with the undulating landforms around it.” (Ryue Nishizawa)
Figure 9
Teshima Art Museum by Tokyo-based architect Ryue Nishizawa and Japanese artist Rei Naito. Photo Credit: Nobu Morikawa
The first featured review on the Yelp page for the Fifth Avenue Apple Store reads, word-for-word: "Walking in the fifth avenue, at the corner of central park, you will find a nice glass cube." Only when one scrolls further down the page do discussions of customer service begin to surface. Here is the epitome of “photogenic architecture”: the focus of the Apple Store is on form, rather than function.

The more that one examines the customer experience as described by so many of these reviewers, the more it becomes clear that the Apple Stores are pursuing an agenda quite different from that of a straightforward retailer. The experience of the Apple Store is more of an aesthetic than a commercial one. A friend, in conversation on this subject, agreed: "I definitely didn’t feel like I was in a store to go shopping," she said. "I felt like I was in a tourist attraction." Ideally, the beauty of the store lures in visitors – visitors who may or may not be persuaded, once inside, to shop. This leads us to a very good question, posed by that same alienated friend: "How does a store become a tourist attraction?"

One way that a store becomes a tourist attraction is when a building becomes a design object. A building, like anything else, becomes a design object when there appears to be a significant disconnect, or at least an unequal valuation, between its form and its function. In the case of the Apple Stores, the disconnect comes from Apple pushing apart the words “Apple” and “Store,” even as they push the two together in an oft-capitalized title that becomes something of an entity in its own right. Like the iPhone and MacBook, these stores are known more for what they look like than what they do.

The reinterpretation of “shopping,” per se, in the form of the Apple Store is one that can be seen in the abundance of mainstream tech press that focuses on the form the building takes rather than the merchandise that will be available within. CBS News, for example, has a slideshow on its website that highlights “The World’s Coolest Apple Stores.” Vox Media’s The Verge published an article with
a similar tone upon the opening of a new location in Japan, presenting images and descriptions of the building under the title “Inside Apple’s chic new Tokyo store.”

New York Magazine just this past year ran a story that aimed to tell “The Untold Story of How the Apple Store Cube Landed in Midtown.” As Apple fan-blog Cult of Mac puts it, “Apple stores are iconic throughout the world for the level of design that goes into their construction. In fact, it’s almost like they’re Apple products themselves.”

The three Apple Stores above 40th Street in Manhattan – the Upper West Side store, the Fifth Avenue store, and the Grand Central store – are examples of this tendency towards primacy of design. These stores are beautiful because they need to be. All three stores face similar pressures as the primary representation of Apple – a hugely popular and successful multinational company – in one of the world’s foremost urban centers. The Fifth Avenue location, as the company’s flagship in New York, has extra pressure to impress, situated as it is on the edge of Central Park and with neighbors such as Gucci, Tiffany’s and Louis Vuitton. The Upper West Side store finds itself in a similar predicament, with the cultural and architectural behemoth of the Lincoln Center just three blocks away. The Grand Central store must make an impression inside of an architectural landmark that is perhaps Manhattan’s busiest hub. When a company is known in large part for its aesthetic, its retail locations must also fit the carefully cultivated brand image. The pressure to be different, to stand out, is doubly true when its neighbors, as previously mentioned, are also known for upholding high standards of design.

In keeping with Apple’s brand image, three stores prioritize certain formal elements in order to create an aesthetic experience that mirrors that of the products they house. The first and most obvious of these is in their materiality – they, like the MacBook, are sleek, grey and blue and glassy. All that is immediately visible of Fifth Avenue store is a perfect 30-by-30 foot glass cube centered in a flat expanse of concrete, as clear as the Retina screen and as sleekly minimalist as the product design that has helped make Apple so popular. From its center snakes a glass spiral staircase that leads down, below ground level to the actual “store” area. The Upper West Side location employs a similar formal strategy. Like the Fifth Avenue store, it too has a glass stair that leads downstairs to the more functional area of the build-
ing. It features a glass box as well, this one much larger, with a curved roof and supported at its sides by concrete monoliths, recalling perhaps the laptop with its aluminum case. Narrower glass panes placed horizontal to the façade recall the banded effect created by the view of the General Motors Building as seen through the Fifth Avenue store.

The Grand Central store, though, differs in its materials from the other two, and at first glance it might seem like a digression from the standard; it is harder to see the literal interpretation of the Apple product in its design. Here, what is notable is not the glass but the lack thereof. The store is open to Grand Central Terminal, and as such it takes most of its form from the existing structure. Like its fellow stores and every Apple computer, though, it features the glowing Apple logo at the center of its face, and focused on this point, one almost can imagine glass stretching up from the banisters of the balcony upon which the store rests. Even without the Apple Stores’ signature material, the Grand Central store manages with a confluence of familiar elements to recall the feeling of a wall of glass; just seeing that logo and knowing that it’s an Apple Store is enough.

Part of what makes the Grand Central location so recognizable as an Apple Store despite the lack of glass is the typification that continues inside. Every Apple Store has a Genius Bar, and these three are no exception. At all three of these locations, the Genius Bar takes the form of a long, wooden counter in front of a wall bearing alternating blue screens and etched Genius Bar logos. Black stools line the counter, spaced at even intervals. The form of the Bar is echoed in the light-wood display tables, which fill the rest of each store’s customer-accessible space. Some of these display tables have the same black stools found at the Genius Bar, while others require the customer to stand. All of them, though, bear neat rows of Apple products, laptops and phones and tablets as sleek as the stores in which they sit.

In Apple’s promotional images, all of these so many screens show the same image, often Apple’s signature nebula background. These products, it is important to note, are only display models. They are mere showpieces; you can buy devices just like them by speaking to an Apple Store employee, but none of them is for sale. It is probably much more convenient to buy them online, where one doesn’t have to deal with the long lines and tourists that often accompany these stores. The inconvenience of
in-store shopping only emphasizes the redundancy of the products on display. Stripped of their functions both as useful objects and ones available for purchase, they become design objects within a larger design object.

Perhaps the most telling sign of the Apple Stores’ form-focused agenda can be seen by what is missing from Apple’s promotional images. Not one of the interior shots of these three stores shows a single person, and the exterior ones have only the unavoidable blurred passersby. There are no users for the technology, no staffers or shoppers for the store. The vision of its empty stores that Apple presents is a very different one from the crowded reality. In a similar fashion, the names of the architects are of little import, just as no individual industrial designers are credited for Apple’s products. Though everything is so thoroughly designed, it is as if it all sprang from the ether in its perfection like Aphrodite from sea foam. Apple doesn’t need people to create or support it; it just is. Apple posits a different type of store. Instead of creating simple retail outlets, Apple creates extensions of its brand that reiterate its product design agenda on a larger scale. And, as far as branding goes, this approach seems to be working pretty well. After all, the Apple Store is ubiquitous. The Apple Store is iconic. The Apple Store is a landmark and its own gift shop, wrapped up in one.

Architecture, a world that is neither fully artistic nor scientific, has as its goal the creation of spaces that fulfill societies’ needs. Yet, as anything bound by the laws of physics, the buildings encompassing these spaces change and deteriorate. It was not until very recently – around the 19th century – that architects realized the importance of preserving old, decaying structures. Efforts in raising awareness of the need for historic preservation have precedence from art critics like John Ruskin and William Morris. The rationale behind this movement was a building would outlive several generations, and throughout this time, the structure would be full of indicators of how the different generations’ inhabited the spaces. Keeping the buildings alive meant keeping fragments of the history of societies.

There is one thing all buildings that are preserved have in common – they are all finished constructions. Preservation works by restoring the buildings that architects many generations ago built. Construction and preservation, which are intrinsically related, happen at different times of a building’s life cycle. But, what happens if a space needing to be preserved was never completed?

One of such few, yet fascinating cases, is the complex of Artistic Schools in Havana, Cuba. Commonly known as the Cuban National Art Schools, the project was initiated right after the Communist Party under the power of Fidel Castro, took control of the island in 1959. The construction plans started almost as the buildings were being designed in 1961.

The architects, Ricardo Porro, Roberto Gottardi and Vittorio Garatti, were given full authority over the design and at the time they were among the ‘most favored’ architects on the island. The Communist Party would later prove to be a party of favoritism, confirming the notion that some-
one’s success was not defined by talent, intellectual capacity or artistic quality but by the social connections of the individual. Moreover, success in architecture and the arts in general was to a great extent defined by the higher up chiefs’ likings of the pieces in question.

The design of the schools was inspired by each of the subjects or branches of arts each school was to host. There were five buildings in the original plans: Modern Dance, Plastic Arts, Dramatic Arts, Music and Ballet. Each subject was distributed among the architects depending on their interest and experience in that field. The result of this design strategy based on affinity was an architecture that reflects the artistic flows of each of the art divisions.

After more than sixty years, the artistry of the buildings has blended with the force of nature to create a visual phenomenon comparable to that of ancient temples.

The School of Ballet, for example, designed by Vittorio Garatti, was never completed and remains today in a state that could be called “in ruins”. The flow of the curves, arches, the sequence of domed volumes are all choreographed in such a way that it communicates and inspires movement: just by looking at the plans we dance. The open auditoriums solemnly inspire and evoke the art within us, as if this was a temple venerating “Ballet” as a divinity and not a school teaching it as a concept.

Originally, Castro agreed to the designs due to their radicalism and beauty. The impulse to make the design of each school unique, reflective of the art each hosted, and to counter the rectilinearity of the International style was shared among all three architects. The design for the schools try to be inspirational, curvilinear and fluid, while still modern. The avant-garde design concepts were to also inspire the art students in a very direct way. A country that was trying to show high standards of equality and freedom, but ultimately showcasing grandiosity, would push the system’s ideals through the education of the new generations. The Cuban schools are therefore full of ambition and Cuban pride – by wanting to form artists that would show the world the high quality of the education in Cuba, thus the success of Socialism.

By 1965 the construction of the schools and the architects fell out of “favor”. As the Communist Party settled in the island, Cuba became extremely dependent on the Soviet Union’s resources, economy and goods, partly because both governments shared ideals and fantasies. Yet, the dependance for the most part resulted from the expropriation
of all private businesses back in 1959. Castro had destroyed every private industry on the island and now didn’t have enough resources to nurture his people. The prefabricated, functional Soviet construction blocks became the prominent building system in Cuba. The style of the schools was completely against the uniform, rectilinear nature of the Soviet-like buildings. The forms were also seen reinforcing as a cult of individuality in a society in which the individual’s desires and ambitions were unimportant. The construction of the schools was thus slowed down. Fewer and fewer workers were assigned to complete the structures and at the end the building process ‘was stopped’.

The abandonment and use of the schools remained in different stages. Some of the buildings were never completed, yet others were. The Schools of Modern Dance and Plastic Arts continued to be used, though with little regard for their maintenance, and the Schools of Dramatic Arts, Music, and Ballet were allowed to fall into various states of abandonment and decay. The School of Ballet, nestled in a shady ravine, became completely engulfed in tropical jungle overgrowth. Ricardo Porro and later Vittorio Garatti were compelled to leave the country for political reasons. However, the schools have been used for more than sixty years now.

Starting in the 1980 there has been an incremental awareness of the dramatic fate of the National Schools of Art. The Schools were finally brought to life in 1998 by John A. Loomis in his book Revolu
tion of Forms. The style of the schools has been considered as avant-garde and truly revolution- ary for its time. Documentaries such as Unfinished Spaces by Alysa Nahmias and Benjamin Murray in 2011 - articles, and distinctions have been awarded, to honor the architects and to protect the buildings. Even ballet dancer Carlos Acosta, graduate student of the National Schools of Art and permanent member of The Royal Ballet in London, involved Architect Norman Foster in talks and proposals about the restoration of the School of Ballet in 2012. The remaining question becomes: should the schools be preserved or completed given their current state?

The political, social and economic environments surrounding the Schools of Arts has changed since the time of their construction. The revolutionary optimism experienced back then has been replaced by frustration and deceit. The production of art has also been affected in many ways; while before, the 1960s art students were to make Cuba proud by showcasing their talent, now the word “censure” suppresses art students’ attempt to be radical or even known. Film director Juan Pablo Daranas Molina, graduate of the National Schools of Art (Escuela Nacional de Artes), and friend of the author of this text, best expresses this idea of censure in his short film Yunaisy produced in 2014.

The fate of the Cuban Schools shows that Architecture is intrin-
cisically related to the social, economic trends of the time around it. The non-completion of the schools was due to a set of political situations that took labor and attention away from them. The economic constraints of the embargo and the Cuban people’s helplessness and complete dependence on the Cuban government all were fac-
tors that hindered the spaces and how there were built. The decline of the schools was inevitable.

Yet, the conservative view of preserving the buildings as originally intended might not be adequate in this case due to the historic disconnect between the construction time and now. Three of the schools were never completed; thus, there was never an established parameter of what the restoration should go back to, only drawn plans. If part of the preser-
vation of the schools involve com-
pleting the unfinished structures, why not take the opportunity to re-design the “unfinished” portions so that the buildings lifetime gets further extended by making it relevant to modernity and the new conditions of the Cuban society and artistic community?
According to American architect Louis I. Kahn, “schools began with a man under a tree who did not know he was a teacher discussing his realization with a few who did not know they were students.” Over time, institutions were introduced as physical spaces to house intellectual discussion and creativity between teacher and students. Architecture now assumed the responsibility of cultivating the practice of teaching and subsequent learning.

In 1995, the National Middle School Association stated: “The climate of a developmentally responsive…school is safe, inviting, and caring; it promotes a sense of community and encourages learning.” While a “climate” and a “sense” that is “safe, inviting, and caring” is indeed fundamental to create a conducive educational setting, there is no explicit mention of how the physical space can achieve such an environment. Such omission reinforces Kahn’s trepidation when he said, “Our vast systems of education, now vested in institutions, stem from these little schools but the spirit of their beginning is now forgotten. The rooms required by our institutions of learning are stereotype and uninspiring.”

All too often the quintessential American school appears as a multi-story, brick-clad, monolithic rectangular structure with its insides containing identical rooms only differentiated by the teacher’s purchases at the local crafts store and by maze-like hallways. For many of us, we will spend about eight months of the year for almost twenty years of our lives in school. As an enormously intrinsic chapter of our lives, consuming practically the majority of our youth, education must be situated in spaces that propagate productive stimulation.

Just as the practice of architecture has always been predicated on the basis of challenging itself, educators in command must channel the same disposition by challenging the structures that house teachers, students, and the creative mind. This begins with nursery schools, where the minds are like sponges fiending for opportunities to develop themselves. In order to push the limits of our potential, the learning space must mimic the same goal. The Reggio Emilia Approach, which was introduced post World War II, responded to the unimaginative atmosphere precipitated by the physical lack of differentiation and utter drabness. By emphasizing the notion that form facilitates the most optimal educational attainment, aesthetics of beauty and uniqueness in Reggio school designs started a dialogue challenging the typology and thus starting to ameliorate a very real concern in educational design.

Using the following three case studies of primary schools completed in 2014, we can see how much of an impact can be fostered when design respects the environment, culture, the needs of the student body, and the little things that ultimately make us different. The onus is on architecture to push the limits to achieve these necessary expressions of difference in education and develop each school, in the words of Kahn, as “a world of its own.”

“Every building you build is a world of its own, and that this world of its own serves an institution, something which has been instituted by man as being important to the way of life of man.” (Louis I. Kahn)

1. Kahn, Essential Texts, 64.
3. Kahn, Essential Texts, 64.
Found in the fishing village of Råå, situated between two large bodies of water in southern Sweden, sloping surfaces seem to organically emerge out of the ground. This doesn’t sound like the description of your typical kindergarten, does it?

The Råå Day Care Center, designed by Dorte Mandrup Arkitekter, caters to four different age groups, each situated under a separate gable of different heights that cohesively flows as if to emulate a sand dune (except this sand dune is made out of multi-toned timber).

When molding this design with all its triangular elements and varying angles of elevation, the architects were motivated to construct a form that stands as an aberration while also imitating small aspects of the area: “The building is based on the surrounding landscape, with its flat slightly sloping dunes and the distinctive typology of the small fisherman houses. Large windows in the façade and roof create a close contact with the sea and surrounding landscape, and provide ideal daylight conditions all year round,” which ultimately creates a “fluent spatial experience and consistency and transparency through the entire institution.” ⁶ The interior’s soft white walls and pastel green flooring, timber furniture and lime-colored toy boxes, glass cut-outs in the corridor walls, hidden nooks in scattered playhouses, octopus-shaped lighting fixtures, and cave-like tunnel add character beyond the beautiful exterior facilitating an enriching habitat.

The culmination of these elements presents much more than an architectural rendering of a weathered sand dune against a beach backdrop. The architects incorporated the built environment but still produced a structure entirely unlike all the others—its own illuminated oasis for children to move about freely, exploring the continuous space with all its different shapes and sizes.

When Kahn idealized structures as “a world of its own,” Danish studio COBE must have been listening. Forfatterhus Kindergarten in Copenhagen contains five interconnected buildings encircling a large recreational outdoor area in the “attempt to create spaces in various scales, according to the children’s needs in the interior as well as the exterior.”

The project ultimately reveals itself to be a scaled-down “village,” in the words of COBE’s founder Dan Stubbergaard.

The project’s surroundings consist of Copenhagen’s historic area, full of repetitious red brick-clad rectangular boxes scattered over the city like a copycat of Lego constructions. Interestingly enough, a large quantity of these buildings are nursing homes. In order to establish a space with a whole new intention and audience to service - active, curious little children - the designers set out to “understand the area’s characteristics...but at the same time create something new and contrasting.” Such an endeavor was successfully implemented as seen by the building’s curvaceous walls and vertical brick lamellae, referencing the rustic tones of neighboring buildings. The free-flowing structure with its rounded edges looks as though a child’s hands molded it out of clay, and despite the conspicuous contrast from its surroundings, it is still visually captivating for the young and old alike. As children can safely explore the expansive outdoor playground occupying the majority of the gated lot, they can also step into any of the school’s buildings and be mesmerized by the starkly all-white interior which allows toys, books, plants, and everything else on the inside to incite curiosity.

The architects behind Forfatterhuset understand what it means to challenge the built environment and produce “something radically new and different” all while respecting the established, historic character of the area. The youthful, spirited design goes hand-in-hand with promoting a “safe, inviting, and caring” atmosphere with extensive opportunities to learn and be creative, thus developing a successful institution for children to grow, certainly worthy of an A+.

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12. “The Exemplary Middle School.”
THE FARMING SCHOOL

If flying overhead Dong Nai, Vietnam, a peculiar ‘tri-looping’ green space would instantly grab your attention, and of all the things one could surmise about its purpose, a kindergarten may not be one of them.

As demonstrated by the previous case studies, designers commissioned for these schools are determined to make more than just aesthetic masterpieces. They strive to question the typology of built structures—in this case primary schools—and to use the surroundings as a respected precedent to formulate an entirely different newness focused on the needs and creative capacity of its users. Vo Trong Nghia Architects are among these visionaries.

For the Farming School, sustainability is integrated into the heart of the construction. From the beginning, the architects were cognizant of the area’s economy and daily realities of its students. The vast majority of the children’s parents work at a nearby shoe factory, echoing the country’s shift from a historically agricultural economy to a manufacturing-based one. The exponential increase in urbanization, along with a transition in economies, is collectively taking a palpable toll on the environment. Farming Kindergarten strives to reverse this mentality by building a school that fosters a strong relationship between nature and students from a young age and allows them to cultivate the physical space with tangible results. This is achieved by a vegetable garden along the “knot-shaped” roof and three protected courtyard playgrounds on the ground level. And when students are not “recover[ing] their connection to nature,” the abundance of natural lighting and the simplicity in design of the interior allows students to take a break away from outdoor stimulation and channel it in another vein.

For those whose takeaway from these case studies is only that money can afford unique schooling opportunities, I will quickly prove you incorrect. The Vietnamese architects worked with a very limited budget, but their passion to establish a prototype for sustainable design in schools motivated them to find a solution: “economic materials that were readily available, including concrete, bricks, and tiles…[and] the use of solar power to heat water, and recycling of waste water from the factory to irrigate greenery and flush toilets.”

While a project such as this may cost a pricey penny, Farming Kindergarten stands as a testament, showcasing the possibility to produce an innovative structure, different from its surroundings based on the intention of the institution, while being cost effective and environmentally respectful.

13, 14, 15. “Vo Trong Nghia’s Farming Kindergarten.”
Cities are hubs of development, advancement, and growth, and it is impossible to deny a city’s ability to be successful in this realm. However, the success of a city is called into question when its ability to be sustainable is out-dated and does not meet the demands of a growing population. Moving forward, it is no longer satisfactory for cities to only be sustainable. Rather, it is important that cities be self-sufficient in terms of food production and distribution. An analysis of these food systems offers a unique perspective into issues of land ownership, economic benefits, and the culture and pride that forms around producing locally. Both FreightFarms and the Brooklyn Grange Rooftop approach the common goal of transforming the existing cityscape to work towards a new advantage in urban design.

The demand for locally sourced food has become a pressing issue in New York City. The ideal of a successful, sustainable New York has up until very recently been its ability to advance in the technological, business, and cultural sectors. Now, the definition of sustainability has been put to a new test, one that requires New York to become increasingly self-reliant. In order for NYC to be sustainable, its inhabitants must be able to maintain a consistent quality of life at an economically feasible rate. Affordable housing, school systems, and public transportation are just some examples of the many different factors that are taken into consideration when determining quality of life. Yet per-
haps the most pressing issue is food, a necessary commodity that cuts through economic barriers. Tackling food systems has become a pressing issue in all neighborhoods across New York City, as populations increase at unprecedented rates. There has been widespread government support and funding for a greener New York. For instance, the Brooklyn Grange was financed in part by a $592,730 grant from the DEP’s Green Infrastructure Grant Program. This governmental support is fueled by a desire for more economically efficient ways to distribute fresh food in the city. Local food production will support the local economy by providing farming jobs within the city and greatly reduce the reliance on imported goods. The benefits of urban agriculture are immeasurable and, until recently, there has been little space for production within the city. New startups such as Brooklyn Grange and FreightFarms are combating the issue of limited space by designing solutions that are easily assimilated into the urban landscape. They challenge the definition of farming, proving that big tools and tractors are no longer needed to harvest produce. As a result, they are able to adapt urban space to accommodate a new, different definition of self-sufficiency.

The FreightFarms community has centered their work around vertical farming. Their Brooklyn counterpart, SpringUps, has been successful in implementing this model in New York City. FreightFarms has been able to coordinate with an existing food service, Fresh Direct -- an online service that provides New Yorkers with supermarket goods directly to their door -- to immediately deliver locally-sourced produce throughout the city.

FreightFarms employs a vertical method of growing that produces a high-yield of crops when compared to the actual acreage of the growing space. Their hydroponic system is put to use inside old freight containers, thereby repurposing and transforming these once static objects. The hydroponics are optimized for growing lettuces, microgreens, herbs, and kale. While FreightFarms is only able cover a portion of the market selection, it still does its part in tapering transportation and production costs that occur when food is shipped across country or within the state. An important factor for New York and other east coast cities is that FreightFarms allows for goods to be produced year-round, independent of, and unencumbered by, the seasons.

Ten stacked freight crates are the equivalent of one acre of farmable land yet only take up 5,000 sq ft footprint. By contrast, traditional farming methods require 43,560 sq ft to meet the same needs. Another organization, SpringUps has set up in empty industrial manufacturing lots in Brooklyn.

FreightFarms and SpringUps have created a sustainable method of growing and producing foods that can be replicated and intensified. Materials are readily available and have already been adapted to fit into the urban landscape. What makes FreightFarms and SpringUps successful is the fact that their design solutions are local and adapted to the cityscape. Urban agriculture is possible with significantly less land than conventional farming.

The Brooklyn Grange farm in Navy Yard currently holds the title of the largest rooftop garden in the world. The garden has been planted on top of an existing factory building, Building No. 3, and the rooftop is able to support a
vegetable farm as well as an apiary. The planted vegetables span across 65,000 sq ft and the apiary houses 30 different beehives. The garden, like many others, got its start from city funding. The DEP’s Green Infrastructure Grant Program provided the Navy Yard with an integral startup boost. In New York City, this type of funding is not uncommon. As mayor Michael Bloomberg noted, “This is one of the biggest projects we’ve funded as a part of our program and will help us meet our PlaNYC goals for a greener, greater New York.”

Bloomberg’s encouragement of the rooftop farm, among many other projects, is rooted in his ability to see the multiple benefits of the intervention. Its location on the roof proves especially advantageous because it responds to the building underneath and the natural elements it is susceptible to. For example, the farming space is able to heat-regulate the building by providing insulation. The soil also collects storm water, taking it off the streets, diverting a potential flood hazard for the production of crops.

The crops currently sold include salad greens, rainbow chard, kale, basil, eggplant, ground cherries, and cucumbers. The Navy Yard welcomes visitors year round to experience the alternative lifestyle that is taking shape parallel to the city’s ever-changing skyline.

The model of the Brooklyn Grange can be replicated on other large, industrial buildings across the boroughs. Building owners are eager to house these farms because they can collect rent on this previously unused space.

Each of these solutions have taken shape in response to a growing need for ‘more space’ and a better quality of life within the existing city. It is reasonable to accept that an urban environment is able to provide for its inhabitants. It is necessary and, of course, possible to adapt the urban environment, but the process includes redefining current notions and assumptions of farming and food production.

This re-evaluation takes shape in a variety of unconventional ways. Rather than replicating known methods of farming, the process engenders different and innovative definitions of ‘sustainable’ farming, ‘green’ gardens, and ‘local’ crops within the confines of a city space. Collectively, these new methods answer the question: How can a cityspace expand its livable surface to accommodate a rising population? They also suggest that, in order to make a city sustainable, it is necessary to use a combination of new technologies and visionary, creative thinking.

“The only sustainable pathway out of rural and urban poverty is a structural transformation of the economy that is driven by higher agricultural productivity, the gradual shift of jobs from farms to factories, and the rise of a knowledge-based and skill-intensive service sector that is mostly urban-centered.”

(C. Peter Timmer, Wall Street Journal)
Mr. Plumbean lived on a neat street. Every house looked the same—reddish brown walls, four green-framed windows, a black roof, and a spotless front lawn. One day, a seagull dropped a can of orange paint on his roof, disrupting the strict visual order of the neighborhood. His neighbors demanded he clean up the mess, but Mr. Plumbean was inspired by the big orange splot caked on the top of his home. He painted baby splots. He painted the face of a lion, elephants imitating steam shovels, colorful wavy forms reaching every corner of the surface of his home. He built a clock tower, planted exotic trees and shrubs, hung a hammock right in the center of his lawn and sat back to admire all his hard work with his new pet alligator. The neighbors said, “Mr. Plumbean has popped his cork, flipped his wig, blown his stack, and dropped his stopper.” Mr. Plumbean responded, “My house is me and I am it. My house is where I like to be, and it looks like all my dreams.”

In reality, Mr. Plumbean and his dream house were a few strokes of marker on the pages of a children’s book, The Big Orange Splot by Daniel Manus Pinkwater. It illustrates for four to eight year olds the themes of individuality and the importance of following your dreams, but akin to any fable targeted at a younger audience, the story can educate readers of all ages. How many people can claim they live in their dream house? Or, the more poignant underlying question, how many people live “on a neat street?”

The answer is too many. Mr. Pinkwater’s “neat street” is analogous to a very real model of residential development called tract housing. Tract housing divides an expanse of land into lots and covers each portion with nearly identical homes. The model was originally implemented in the United States on account of two reasons: (1) a post-World War II society’s increased demand for homes suitable to raise families and (2)
advances in public and personal transit that made living outside of the city feasible for workers. The iterative nature of the model and its widespread application gave rise to suburbia—miles upon miles of isotopic homes huddled at the periphery of a city.

Now, over fifty years after its inception, tract housing continues to be implemented despite major shifts in the social, political, economical, and technological spheres of our nation. The protracted use of this model by developers defeats the potential to display the progress of the architectural world by reissuing standardized forms and materials, cheapening and overexploiting them through excessive repetition. Moreover, it deprives individuals of the freedom of constructing or contriving their personal surroundings and communities. Fixing the discrepancies of having applied a stale housing development model is the new challenge and the next step towards realizing the antithesis, unique dream houses.

Tearing down the existing community fabric and rebuilding is not the most appealing approach financially, and wishing for a natural disaster to generate a tabula rasa is not necessarily the most ethical approach; the next stage thus involves “retrofitting suburbia.”

Coined by architect Ellen Dunham-Jones in 2011 in her book *Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs*, the process of “retrofitting suburbia” aims to transform and redesign suburban landscapes into more urban and more sustainable communities. This methodology implements three strategies: re-inhabitation, redevelopment, and re-greening. By repurposing empty buildings and filling too-wide lots between existing buildings, parts of suburbia once unused become more like a downtown urban area, communal and walking-friendly. If there are too many areas in need of being re-inhabited or of greater inhabitance, some further away piece of the tract can be undeveloped and uninhabited in order to make a particular region more dense. Re-greening can be applied either for the benefit of the residential community (ie. public parks or gardens) or the ecological environment that was pushed aside when development in the suburb first began.

Twenty miles north of San Diego, California, the city of Carmel Valley provides an excellent example of a suburb in need of retrofitting. Carmel Valley’s first series of housing developments began back in 1974, and even to this day there exist more plans for future developments because San Diego’s population continues to increase. Fortunately, the city does have at
least one development that carries out the three strategies of "retrofitting suburbia." On the outer edge, closest to the highway, a new expansion called One Paseo would be a 1.4 million square foot mixed-use area of retail shops, dining areas, apartments, offices, child care services, park space, and bike paths that will emphasize walkability and mobility in a city that is, like a typical suburb, predominately rows of homes navigated by cars. The rough outline of the design suggests dwelling units will occupy at minimum forty percent of the development. This construction is critical and progressive because it would be introducing a type of housing not typically found in suburbia. Integrating housing into and above a retail and public oriented space has never been implemented in Carmel Valley. These future units would be one of the smallest kind of residential options in Carmel Valley which may interest a previously nonexistent demographic into the city. The existence of One Paseo and the popularity of Ellen Dunham-Jones’ methodology indicate that people acknowledge the shortcomings of tract housing. Acknowledgment, and consequently the willingness to address the problems of suburbia, will with any luck make the middle-aged tract housing model obsolete. By halting the construction of tract construction and beginning to reconsider the suburban landscape, individuals and the architectural community move one model closer to a more personal and direct relationship that could culminate in a future of dream homes being constructed instead of standards. Furthermore, there is the possibility that by retrofitting suburbia, turning highly privatized isolated spaces into more community-oriented accessible spaces, the importance or desire to realize "dream houses" would diminish. This phenomenon occurred on a small scale in The Big Orange Splot. After Mr. Plumbean painted the exterior of his home and "re-greened" (to borrow Dunham-Jones’ terminology) his front lawn, he spent the rest of the story on his hammock, interacting with his neighbors and relaxing outside the walls of his home. Perhaps the concept of a dream house is more contingent upon its surroundings than one would expect, even in the alternate universe of a children’s book from the seventies. A landscape of varied housing and building types stimulates and attracts more interest in interaction and exploration than plots upon plots of the same privatized houses. If a suburban community became more self-sufficient (i.e., not just rows of isotopic homes navigated by a minivans and suburbans), consequently that balance would ease the program of one’s dream house. “Then all the people would say, ‘Our street is us and we are it. Our street is where we like to be, and it looks like all our dreams.’”
In June 2007, Columbia University submitted a rezoning proposal to the City of New York for the neighborhood known as Manhattanville. The subsequent approval of Columbia's proposal by New York City officials allowed Columbia, a private institution, an increased amount of power and control within the development of the neighborhood. Columbia's rezoning proposal was motivated by plans to expand their campus, that had first been publicly announced in 2003. The expansion, designed by Renzo Piano Building Workshop, will create room for more academic and research space in the northern Manhattan area, from 129th and 133rd between Broadway and 12th Avenue. In May 2009, New York State's Public Authorities Control Board granted the final public approval for the University's plan.

The $6.3 billion plan will be completed in two phases, the first to be completed by 2015 and the second by 2030. One must wonder how Columbia's expansion plan will change the neighborhood, and exclude some of its long-standing residents from their home. Who is this expansion serving? Furthermore, what is being displaced and altered in the wake of Columbia's push forward that hints at a future of New York City gentrification?

“New York isn’t New York anymore, New York is a tourist destination.” (Ramon Diaz)

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It may initially seem as though Columbia University, a well-respected institution of higher education, is doing positive work by expanding into the Manhattanville/West Harlem neighborhood. By spreading their financial resources and world-renowned cultural and intellectual capital into a notoriously poverty-stricken and underserved area, it might appear as though the University is not only working to grow and strengthen itself as an institution, but is also helping the neighborhood that it is expanding into. Many hope that the University's expansion will improve employment opportunities in the neighborhood, as well as make the urban infrastructure of Manhattanville both safer and more efficient. However, one must
question whether or not this relationship is truly mutually beneficial.

In 2007 the approval of Columbia’s rezoning proposal by the City of New York essentially granted the University legal permission to confiscate privately owned businesses and residences standing in the way of their plans for development. This legal destruction of homes and businesses is justified by eminent domain. Columbia’s permission to exercise eminent domain over the entire 17-acre expansion zone came after United States Court of Appeals for the Second Circuit overturned a lower court ruling that prevented the state from using its power of eminent domain to take private property in the area.

Eminent Domain, under the New York City court of Public Appeals, allows private institutions to take over any type of property standing in the way of private development if it can be proven that the neighborhood is “blighted” and that new development would be in the interest of the “public good.” Where this becomes problematic is that “blighted” is often used as a synonym for poor and underserved, and that “public good” is often used as a tool to improve the quality of life for already privileged or advantaged people.

The Department of City Planning’s approval of Columbia’s proposal to rezone the Manhattanville neighborhood allowed for the deregulation of rent prices in residential buildings not under the jurisdiction of public housing. The deregulation of historically rent-controlled residences has been and will continue to be a driving force behind a significant climb in neighborhood rent prices. In all likelihood, this new lack of non-New York City Housing Authority (NYCHA) owned, affordable housing in the neighborhood will force working class families to leave the neighborhood in search of cheaper housing opportunities elsewhere.

It is tremendously significant that Columbia is attempting to expand into a poor neighborhood, where the locals are not likely to have the power or resources to resist the expansion and to keep their homes safe from Columbia’s takeover. It is also a neighborhood that would see a massive demographic shift as a result of Columbia’s expansion and the subsequent gentrification that it will leave in its wake. According to 2008 statistics provided by City-Data, the median household income in the Manhattanville neighborhood would simply be nowhere else to go for New York City’s working classes.

Top: The bustling intersection of 125th Street and Broadway as it appears today. (image: http://www.panoramio.com/photo/45849411)
The neighborhood is about 33 thousand dollars, and the average household size in the neighborhood is 2.8 people. The Federal Poverty line for New York State in 2014-15 is $29,000 for a household of two, $36,000 for a household of three. Based on the comparison between the median Manhattanville income versus household size and the New York state poverty line, these statistics place the average resident of Manhattanville at or below the poverty standard. The rezoning of the neighborhood and the gradual construction of Columbia’s campus present an imminent threat of displacement for unprotected tenants.

As middle to low income residents of the Manhattanville neighborhood become increasingly excluded from one of the last remaining affordable neighborhoods in Manhattan, and even New York City as a whole, the characteristic of the neighborhood, and the city by extension, changes. It inevitably shifts to become much more hospitable to wealthier individuals and families, and less so to those whose finances cannot keep up with the rapidly gentrifying urban sprawl. The problem with this shift from a low-income neighborhood to a privileged outpost of Columbia University is that there will simply be nowhere else to go for New York City’s working classes.

Additionally, the city’s regulation and support of public housing in the area is vanishing. 3333 Broadway, one of neighborhood and the city's largest residential buildings, is home to over a thousand housing units. The building's erection was initially funded by virtue of the Mitchell-Lama housing program, which gives low-interest loans to private property developers who are willing and interested in providing affordable housing to poor tenants. Under the Mitchell Lama program, property developers and owners can remove rent controls after both 20 years have passed and the original loans on the building have been repaid. In 2005, the owners of 3333 Broadway fully repaid their loan. Soon after, they began to remove affordable, rent-controlled, units in exchange for more expensive market rate apartments.

The University’s entrance into Manhattanville has fueled this process further, by channeling an influx of new tenants willing to pay substantially higher rents. If there is no further regulation, there will be no affordable housing left in 3333 Broadway by the year 2030, when Columbia is scheduled to complete their expansion. The change will proceed along the dividing lines of race and class, replacing a predominantly African American and Latino demographic with largely white newcomers.

The fact of the blaringly obvious racial and financial dissonance between Columbia and the neighborhood it is imposing itself upon makes it clear that when looking at the issue of New York City gentrification and the socio-political circumstances surrounding this issue, it is impossible to ignore or discount the problems of race relations in the city. There is an obvious tension and discrepancy between the largely low-income, Black and Hispanic population of Manhattanville and Columbia's student body, as well as administrative make-up. According to student’s self-identification on the Common Application, 70% of Columbia’s class of 2017 is either White or Asian/Asian American. Many of these students come from wealthy backgrounds and do not receive financial aid on Columbia's tuition, which is over $60 thousand annually.

Even with Columbia’s largely privileged student body, a student body that will not be directly harmed or threatened by Columbia’s expansion, many students have reacted against the plan. Student groups, such as Columbia Prison Divest and the Student Coalition on Expansion and Gentrification (SCEG), the latter which was formed as a direct response to Columbia’s Manhattanville expansion, have demonstrated dissent and objections toward the plans for expansion. In a 2007, SCEG publicly released a comprehensive document stating their aims as an activist organization on campus.
Their mission is as follows: “As students of Columbia University, we find it impossible to stand aside as our University actively ignores and evades the rights of the West Harlem community. Instead of engaging the community in respectful and open negotiation, Columbia has pursued an expansion plan of disruption and displacement. We believe that the community has a right to affordable housing, living wage jobs, and a prominent voice in any development plan for its neighborhood. We believe that Columbia’s plan must recognize the rights of all people regardless of their economic background or race” (http://www.columbia.edu/cu/cssn/expansion/).

The fact of such a significant on-campus oppositional reaction to the expansion demonstrates a dissonance between what the administrators who are pushing for this expansion, such as President Lee Bollinger, and the student body, who these new facilities are supposedly being built to serve.

As Columbia moves in to West Harlem, the neighborhood demographic shift will also see a cultural shift away from the life and vigor it is known for towards a more sterilized, bourgeois identity. In “Homerun,” a 2014 video by Columbia student Corin Coetze, Ramon Diaz, owner of Floridita Cuban Restaurant, a West Harlem “destination restaurant,” laments the loss of what he perceives as the real New York City culture. Diaz says “New York isn’t New York anymore, New York is a tourist destination.” He observes the change in Harlem’s demographic through the revisions he has had to make on his menu, swapping out coffee and pastries for fresh vegetable juices and craft beers, staples of the privileged urbane culinary canon. Diaz says that his customer base has shifted from “blue collar,” working class people, to a more “white collar” crowd who are more demanding but also willing to pay more. He mourns his old customer base saying, “There was a culture here. There was an identity. That’s gone.”

The sharp division between the levels of wealth and privilege that are represented by Columbia’s population and the residents of affordable housing complexes in Manhattenville creates an uncomfortable power dynamic in the area. When Columbia, a highly powerful and globally influential institution, comes in and disrupts life in a largely poor, underprivileged neighborhood, the level of privilege that a cogent establishment such as Columbia enjoys is illustrated. It is this power structure that allows for the production and reproduction of privilege by traditionally elite socio-political players, as well as the continued subjugation of historically marginalized groups, such as racial minorities and low-income populations. Columbia’s expansion is limiting the diversity of the area, and pushing those who are different from the University’s demographic out of their city.
The work of civil engineers, as designers of infrastructure, has to be predominantly functional before it is beautiful. However, the delicate balance between function and beauty establishes the art of infrastructure, as opposed to traditional art. This means that the engineers’ “art” must fit different criteria than other forms of art.

David Billington, a professor at Princeton University, set out a specific term for “structural art” in his 1983 book *The Tower and the Bridge*, using a system of three “S”s or three “E”s as his criteria. The three “S”s that he described were scientific, social, and symbolic. In order to make these “S”s more accessible, he proposed three “E”s as specific examples of what the three “S”s could mean.

Efficiency promotes a minimal use of materials to ensure safety and function. Economy is the cost-effectiveness of the structure. Finally, elegance is the aesthetics of the structure such as they are informed by engineering considerations. At the same time, the concept of structural art also raises more complex issues regarding the durability and value of art through time, as Billington’s framework does not accommodate changes in these criteria over time.

By using Billington’s parameters to understand structural art, we can appreciate the structures around us in a new way. The beauty of these structures came from the aesthetic principles of the designers and engineers who created them (and because cities don’t want to pay for eyesores on the skyline.)

Each bridge in New York City can be looked at through the lens of structural art. Using these criteria, we can evaluate the Brooklyn Bridge, the Hell Gate Arch Bridge, and the Verrazano Narrows Bridge from a new perspective.
The Brooklyn Bridge was a record-breaking bridge, using several innovations to improve the efficiency of the structure to make its span possible. With the advent of steel, large-scale suspension bridges had become a reality, allowing the Brooklyn Bridge to span the unprecedented distance of 1,595 feet. Roebling’s design also added diagonal cable stays to stabilize the structure, which reduced the reliance on a heavy truss system and lightened the overall superstructure.

The economy of the bridge is a more complicated prospect. Roebling was a very popular designer for cost-effective structures, and his structures were often chosen over the designs of others because they were the least expensive proposal. Unfortunately, the construction of the Brooklyn Bridge went significantly over budget, at $15.1 million dollars in 1883, nearly twice the estimated cost. This was due, in part, to corruption in the local government awarding bids to companies who were not reputable.

However, as we move into the present, the economy of the Brooklyn Bridge becomes more difficult to answer decisively. Traditionally, bridges are designed for a 50- to 75-year service life, while the Brooklyn Bridge has just passed its 130th birthday. In 2013, the Brooklyn Bridge was considered “structurally deficient,” meaning that load-carrying elements were found to be in poor condition and the structure needs significant rehabilitation.

The Brooklyn Bridge is undergoing a massive renovation project that is estimated to cost $508 million and four and a half years of work. At what point does it become cost prohibitive to renovate? The Tappan Zee Bridge replacement, for example, is estimated to cost $4 billion and be completed in just over 5 years; it is also designed to last 100 years without significant structural maintenance.

Generally, the Brooklyn Bridge can be seen as an excellent example of structural art at its inception, but its age highlights some of the problems with using this framework. Time is not kind to structural art: the innovations of the structure may no longer be seen as such, and this type of art has every opportunity to degrade. When a piece of art has a requirement first and foremost to be functional, there must surely be a point at which it is uneconomical to maintain the structure.
The Hell Gate Bridge is a steel through-arch bridge designed to withstand railroad loads. Suspension bridges are typically not well suited to rail loads, as the large dynamic load creates large stresses on the flexible decks of suspension bridges. Thus, with regards to efficiency, the choice of a steel arch bridge makes perfect sense. The elegance of an arch bridge has different principles than that of a suspension bridge. Arch bridges bear the load into the ground through direct compression in the steel arch.

Arch bridges must become taller in order for them to span wider distances so that they can maintain an effective compressive force down through the arch. The height required to span the 978 ft and to allow ships to be pass underneath indicated the choice of the through-arch design, as this allows the arch to reach above the height of the deck as the deck passes through the truss mid-arch. However, the stylistic choices made in the design of this through-arch bridge were driven by Lindenthal’s love of art and aesthetic over a desire for engineering elegance.

The flaring top chord of the arch makes it obvious that the top chord carries no load, since it doesn’t connect to the bridge’s footing. This flare was the result of much debate amongst his team, but Lindenthal argued that this was the most visually appealing choice, and the bridge does look interesting from the side view. Most photographs of this bridge are from this angle, and it is difficult to find one looking along the bridge.

There’s a reason for that: the bridge is ugly from that angle. The stone arches in the towers are bisected by the flaring top arch, as seen in the image on the left. Clearly, the stone arches could have been shorter. The towers on either side of the bridge are purely for decoration and are meaningless to the strength of the bridge, as the steel arch bears the entirety of the forces and carries them down into the footing.

In his initial design, seen at the bottom right on the opposite page, Lindenthal did not have any connection between the towers and the top chord, illustrating the futility of both. He later added the steel beam connecting them to make the bridge appear more robust since he feared that the public would assume the towers were structurally important. Rather than simply designing a bridge whose physical form is indicative of the load requirements placed on it, Lindenthal tried to accommodate the misunderstanding of his form. This shows a clear failing on the part of elegance.

Lindenthal’s efforts to make an aesthetically pleasing bridge hindered his ability to create a structurally elegant bridge. Here, we can see the interconnectedness of Billington’s 3 E’s, as inelegance of the unnecessary towers hurts the efficiency of the structure. This also clearly hurts the economy of the bridge. This bridge, while being designed with beauty in mind, did not use engineering principles to inform its design. While the bridge was designed to be beautiful and functional, it cannot be understood to be structural art under
Billington’s definition.

The Verrazano-Narrows Bridge, while less iconic than the Brooklyn Bridge, is a beautiful blend of form and function. It had to cross a huge expanse of water and allow ships to pass underneath, which necessitated a long span. The bridge also needed to be light, because it had to be designed such that, in the event of collapse, the waterway would not be blocked.

These criteria indicated a suspension bridge, which provides a more efficient use of materials with longer spans. The foremost suspension bridge designer of the time was Othmar Ammann. Ammann had a long history with New York City authorities, having designed 5 other bridges for the city (the George Washington Bridge, Bayonne Bridge, Triborough Bridge, Bronx-Whitestone Bridge, and the Throgs Neck Bridge.)

Ammann strived for simple elegance in his later structures and appreciated the apparent expression of function that suspension bridges provided. Ammann’s designs relished the mathematics of the suspension system. He utilized the concept of deflection theory, which proposed that the deck of a suspension bridge could, in theory, be infinitesimally thin as cable tension increases over longer spans so that the deck performs no work. This allowed Ammann and other suspension bridge designers to build bridges with lighter and thinner decks, increasing their efficiency.

The separation of function between pure tension in the parabolic curve of the cables and the pure compression in the towers was something that Ammann tried to emphasize in his works. He created this visually with the slender lines of the main cable and tower combined with the elevation of the deck at the center of the span, giving the sense that the cables pull up on the deck. This is a perfect example of Billington’s definition of elegance, in which the physical constraints of the forces inform the structure and are recreated in the form.

Record-breaking bridges don’t come cheap, but Ammann found himself with certain choices for the economy of the bridge. For instance, the decision to make a 6-lane double-layered bridge allowed for a 50% increase in traffic capacity over the 8-lane single layered deck while only increasing the cost 13 percent. This significantly increased efficiency -- or the number of vehicles that could cross as related to the cost of the deck -- and proved the concept that this bridge can be understood to have good economy.

However, in the years since its construction, many bridges designed with deflection theory have been revisited as their thin decks are very susceptible to torsion; the deck of the Verrazano-Narrows Bridge had to be made more aerodynamic to mitigate its swaying in high winds. Our knowledge of engineering has changed the principles on which something can be described as efficient, as the theory that allowed the bridge to be exceptionally light meant that the bridge required additional maintenance. Generally, the Verrazano-Narrows Bridge can be understood to be a work of structural art and the bridge currently provides more than enough money from tolls to cover its maintenance long into the future.
Billington’s 3 E’s of efficiency, economy, and elegance provide a reasonable set of criteria to differentiate structural art from both traditional art and engineering. There should be a goal among all structural engineers to make beautiful, efficient, and cost-effective structures.

However, the Hell Gate bridge was at the time, and still is considered “beautiful,” so perhaps this concept of structural art cannot be understood outside of a deeper understanding of mechanics. The description of “structural art” may be valuable within the field of civil engineering to encourage the creation of structures which are not simply functional but also elegant. Yet in public discourse, there is no assumed understanding of structural elegance and efficiency and the term “structural art” may appear exclusionary and academically elitist.

However, the concept of structural art is limited, as it does not account for change over time. Under Billington’s definition, there is no accommodation for the loss of strength or functionality, or for the economy of maintenance, which are all important issues that structures face.

With new understandings of engineering, a design that might have been revolutionary in its time can be seen as archaic and “wrong.” There is also a significant issue of maintenance, as a structure can become inefficient to maintain when the costs required to repair it overtake the functionality that the structure provides. But when something has been called “structural art,” is there any obligation to preserve it past the functional lifespan of the structure?

Some states have bypassed historic landmark guidelines by neglecting their disused structures, such as Breeden’s Bridge seen to the right. Many “historic” truss bridges are left alongside new, functional structures, and the old ones will simply rust away over time.

The balance of preservation and function needs to be rethought. Perhaps the creation of more reasonable guidelines may help keep our history and thus preserve structural art, without art becoming a burden.

When we decide something is art and choose to promote it as such, we potentially reinforce or create social attachment to these structures, which becomes problematic when the structure no longer performs its function and becomes a piece of traditional art, like a sculpture.
CHAPTER 1
WHAT WOULD BEIJING BE LIKE IN 2025?

Imagine a city where the air is so polluted that one cannot see the top of the skyscrapers. Imagine a city where the buildings are so tall that the streets are never exposed to sunlight. Imagine a city where the economic activity is so prominent that buying real estate is only accessible to the 0.1%. This city is Beijing in 2025.

Beijing transitioned to the fastest-growing global economy from a slow communist society that strangled the country up until the early 1980s. Today, in 2025, Beijing is exceeding all the competitors it had in the past. New York City, London, Hong Kong and Dubai had a hard time keeping up the pace. Design-wise, Beijing became a showroom for international architects and investors looking for double-digit profitability. The city displays the most visually stunning pieces of architecture. However, all of that has a price. The city hit the ceiling: its growth that sustained by activities that were not those a global city needs for a healthy and long-lasting development. But Beijing never took into account what it was advised to do. The speed of development, coupled with a strong appetite for profits, did not enable the city planners to pause and think deeper about the consequences of an untempered expansion. Now, consequences are not only economic but they are also social and environmental. As of 2025, Beijing has reached such a high level of saturation in population growth, economic growth and real estate construction that the curves inverted. The city is on the decline. Beijing lost the game it set the rules for.

CHAPTER 2
A HISTORY OF LATENESS

Now that we had a glimpse of Beijing in 2025, let us take a look at the influence of history in shaping the city as it stands today. The city of Beijing did not have access to the global market economy at the same time as global cities like New York, London or Hong Kong. The development of cheap air travel, the boom of the trans-
portation of commodities and the unparalleled improvement of communication systems did not benefit Beijing the way they benefited many other cities. Beijing was not a member of the group of cities that was abiding by free market laws. On the contrary, Beijing was ruled by a communist party that gathered all the executive, institutional and administrative powers. It prohibited capitalism and activities such as finance, new technologies, marketing and advertising. In the early 1980s, Chinese leader Deng Xiaoping took a set of rules that would deregulate the economy to transition smoothly to a market economy. As a wave of new policies and laws took effect, especially in 1986 and 1987 with the Principles of Civil Law and the Thirteenth Congress of the Communist Party, the private sector became an important supplement to the public sector, namely the communist party. The transition to a market economy has brought fundamental and sudden changes to the real estate and construction markets in Beijing, among which a boom in office space construction and other business-related branches of real estate, following a densification of the multinational firm branches. Global corporations opened branch offices in Beijing, first as a response to a demand coming from clients who had the desire to transfer or start new activities in Asia and, second, to reach out to new clients.

Building public infrastructure was a priority for the government of Beijing in order to develop its accessibility from outside the country’s borders and join an already existing and dense network of global cities. Building private infrastructure, namely residential and commercial real estate, became a necessity. This was also a prosperous activity that attracted many local and global real estate investors in search for sustainably high profits. Developers felt the unparalleled potential for construction and started to further develop and renovate Beijing’s Central Business District in the mid 2000s. This growth triggered an increasing demand for office spaces, which was heightened by Beijing’s double-digit GDP growth rate. Growth fuels growth. Investments attract investments. A virtuous economic system formed.

On the short run being late is not necessarily a bad thing.

CHAPTER 3
BRANDING BEIJING

To catch up after a late start, Beijing targeted real estate investors. Somebody had to fund the development of new projects and enable the city to give reality to its ambitions. Marketing the city through architecture is the most
powerful tool that Beijing came up with. In doing so, real estate developers hired architects from the Western hemisphere to design visually stunning projects. These architects are world-renowned and by designing projects in Beijing brand the buildings with their names. In fact, very few local developers partner with Chinese architects. A good example that illustrates this phenomenon is the partnership of SOHO China, Shanghai and Beijing’s largest commercial property developer, and London-based design firm Zaha Hadid Architect. SOHO China built two large-scale projects in Beijing, one called the Wangjing SOHO located between the third and fourth road ring of Beijing, and the Galaxy SOHO located in the Central Business District in the West of Beijing.

“During interviews with the sales personnel, many recounted that although the investors may not understand and appreciate the minimalist architecture design per se, the branding effect achieved by architectural design is a major factor in their investment decision making.” (Xuefei Ren)

Other highly iconic buildings in Beijing are the CCTV tower, designed by Rem Koolhaas, and the National Stadium designed by Herzog & de Meuron. The act of branding Beijing is the act of attracting international attention via the use of an architecture that is highly visual. Zaha Hadid Architect is a meaningful example in that the firm specializes in parametric architecture, which is a process based on algorithmic thinking that defines the shapes of a building. It is relevant to note the use of parametric architecture because the design that results from this process looks very organic. It breaks the codes of walls, ceilings and rectilinearity. The shapes obtained with parametric architecture make emerge a sense of visual uniqueness and flowlessness that can hardly be obtained (or justified) without using parametric algorithms. In the two examples of SOHO China’s programs, because the structure was computer-generated, its architecture does not have any right angle or sharp edge.

It questions the “norms” of “traditional” architecture by not having regular walls, roof or skeleton. The three units that compose both the projects seem to start or end nowhere. It surprises. It challenges. It catches the attention. I would argue that difference is of major influence in attracting real estate investors because it also attracts buyers. The name Zaha Hadid can be compared to that of Karl Lagerfeld whose name is the marketing tool behind Chanel.

CHAPTER 4
CONSUMERISM AND ITS CONTRADICTION

Consumerism defines the preoccupation with the acquisition of architecture on the basis of sheer investment quality over any other value. To what extent does Beijing conform to this definition of design consumerism?

In order to achieve the goal of selling more and selling faster, Beijing has to have a strong visibility and exposure to the rest of the world, made possible by the acquisition of a distinctive design for new real estate programs. Xuefei Ren, specialist of the marketing of architecture in China, explains that at the scale of the city, mega projects such as SOHO China’s are meant to “create a new global image for urban regeneration, to rebrand and reposition their cities in the global economic competition.” By the act of using architecture as an artifact, more and more building designs look alike and project the exact same image of modernity and placelessness.

This is made even stronger by the fact that a significant number of real estate developers work with a very small number of star architects. The result is that between ten and thirteen designs firms produced most of the new developments in Beijing. This results in an increasing design homogeneity, as if the architecture of Beijing can be replicated anywhere at the scale of a city or at the scale of a continent. This argument is what I define as the contradiction: in spite of trying hard to make the city unique and distinctive by means of spectacular architecture, developers and the government are designing a city that has no DNA. This argument is labeled by Rem Koolhaas, paradoxically one of the protagonists of the development of Beijing, as the crisis of the “generic city” that he describes in Delirious New York. Not only has Beijing lost a significant piece of its cultural identity in the process, but it is also going against the very essence of its marketing strategy. It is time for Beijing to revise its business plan.

During interviews with the sales personnel, many recounted that although the investors may not understand and appreciate the minimalist architecture design per se, the branding effect achieved by architectural design is a major factor in their investment decision making.” (Xuefei Ren)