



MATERIAL DIGNITY

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Acknowledgement

This year has been a very bumpy ride to say the least. I am thankful to have come to this part of the process where I now have finished my master thesis. Something I didn't really think was possible a few months ago.

I would like to thank my supervisor Shea Hagy, examiner Liane Thuvander and co-supervisor Emilio Brandao for not giving up on me, and for helping me pull through this. Even though I wasn't able to commit to this essay fully until very late, you did very well keeping up the patience with me, and seeing that I had it in me after all. I appreciate you having the trust in me, and helping me carry this through to the end.

Then most of all I would like to thank my family and friends for being there for me during this year. Without you this wouldn't have happened. You never doubted my ability to finish this, even though I didn't have the time on my side. I really appreciate all the support I have received, it means a lot to have you all in my life and it's good to know that I can count on you! I know that you know who you are!

I would also like to thank all the plastic waste that I used for my photos. Even though it had most likely served its purpose and was headed to its end of life, I am glad that I was able to give it all a second purpose, being used in this project, captured forever.

Material dignity

This is the result of the master thesis work within Design activism beyond borders thesis direction at Chalmers University of Technology, Department of Architecture and Civil Engineering. Master program Architecture and Planning Beyond Sustainability, MPDSD.

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Abstract

This thesis is exploring the definition of material dignity. How architects can ensure what is the most worthy and respectful way of treating a material. The aim of this thesis is to investigate if architects can become more aware in our material and product decisions when designing, by using storytelling as an alternative method of analysing data.

The purpose of trying out storytelling as a method is to see if it can help us challenge our perception. Storytelling has the power to highlight larger societal problems that otherwise might be concealed, by forcing yourself to put yourself in the shoes of the material. The act of narrating can therefore be considered a highly effective transformative power, to make us question what good and bad choices are, and to think about cause and effect. This makes us question things we otherwise just accept.

The thesis explores a single-use, non-biodegradable plastic bottle that probably all people are familiar with, to uncover and see if it is possible to change one's perception about the material and getting a deeper understanding on how to draw your own conclusions on how to make conscious material choices.

The storytelling method turned out to be a good way of analysing data and challenging one's perception of a material. However, the method proved very time consuming and perhaps too complex, which means it might not be an appropriate method for architects to use, but more so in research purposes and in school projects to compile and analyse more complex facts and correlations.

What one needs to consider to ensure material dignity is to not make assumptions on why and how we use the materials we use and to instead question those assumptions. To recognise that we as architects are the ones that decide its worth, and that it is our responsibility as designers to make decisions that ensure material dignity.





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Manifesto

THERE IS NOTHING EITHER GOOD OR BAD, BUT THINKING MAKES IT SO” - WILLIAM SHAKESPEARE YOUR PERCEPTION OF THE WORLD AROUND YOU DOES NOT ALWAYS CORRESPOND TO WHAT IS ACTUALLY HAPPENING. YOUR ACTIONS WILL ALWAYS BE A FAR MORE ACCURATE REPRESENTATION OF YOUR IDEALS AND BELIEFS. IT IS ABOUT THE SIGNIFICANCE OF BEING UNREALISTIC IN A REALISTIC WORLD. UNLEARNING IS SOMETIMES THE MOST EFFECTIVE WAY OF LEARNING. **“A SHIFT IN PERCEPTION AND INTERPRETATION ENABLES US TO BREAK OLD HABITS, AND AWAKENS NEW POSSIBILITIES FOR BALANCE, HEALING AND TRANSFORMATION” - DAVID SIMON**

Student background

Master of architecture:

Architecture and Planning beyond sustainability, Chalmers University of technology
2020-2022

Studios:

Local Context studio
Reality Studio
Future visions for healthcare, housing and work 3: Healthcare architecture

Bachelor of Architecture:

Chalmers University of Technology, 2017-2020

During my time at Chalmers studying architecture, I've become increasingly interested in the social impacts and influences that architects have. It's both fascinating and intimidating to start peeling back the layers of our influences on social and cultural structures, the economics and politics of architecture, and our influences on city development. Starting this, I wanted to learn more about these impacts and look into how our preconceived notions about materials influence how we use them. These in-depth self-reflections aided me in better understanding myself, which was important for me to take into my future profession. Hopefully, this will spark further discussion about material dignity.

My own perception - Before the process

Before getting into this thesis, here's a rundown of my general thoughts on plastics. This was the starting point of this process, and is also acting as a stepping stone for what is about to be investigated, and setting the tone for the rest of the thesis.

This master thesis topic was clearly influenced by my own interest in researching plastics and material dignity. I am perhaps more aware of the consequences of plastic waste than the average person because of my interest in the environment, and I am actively trying to make decisions to limit my plastic footprint on the earth in my daily life. However, in my profession and in comparison to my colleagues in school, I believe we are quite well aware of the problems with plastics, even though we don't really know how to deal with it.

I've tried everything from toothpaste in a glass jar to shampoo and conditioner soap bars, not buying clothing with polyesters, and taking pride in my well-organised recycling station at home. Unfortunately, some of the alternatives haven't been good enough to replace the common plastic bottles and tubes, but at least I am giving it a try.

Going into this study, my general opinion of plastic was quite negative. I've travelled extensively, often in developing countries where people don't have the same capacity to manage their plastics and garbage. I've seen people living on garbage dumps in Southeast Asia, and I've seen ocean plastic burying beaches.

Where plastic is not the most ideal material, single-use plastic should be prohibited. We can't use plastic the same way we do now. Seeing bananas and apples wrapped in plastic upsets me greatly. There should be rules governing when and where plastic can and cannot be used.

Plastic in the construction industry is a contentious issue for me. There are very few places where plastic is visible and looks acceptable. Most of the time, plastic facade material makes the building look cheap, dirty, and sun-stained, and it makes me question the use of virgin plastic to such an extent.

THE STORY OF A PLASTIC BOTTLE

This story is part of the method of this thesis. Enjoy the story, and then read into the rest of the work explaining the use of storytelling and its importance when discussing material dignity.

There are two ways of reading this story. Either it is possible to read the bold, shorter text on each page, which is a summary of the story for a quicker way of going through the story. The other way of reading it, is by reading the lighter font, where the full story is presented in more detail.



Prologue

Here's a story about me, a simple bottle. Maybe I once belonged to you. At the beginning of my journey, I had such high hopes for my upcoming future, being able to serve my human. That however changed quite quickly and my road has been far from straight.

My story might have begun a lot earlier than me being put together and filled with water. However, just like you humans, I am not certain of the exact steps that led up to my birth. All I know is that I am made out of mostly Polyethylene terephthalate, also known as PET. By heating these small plastic pellets, making it into a thick liquid, I was then moulded into my final shape until hardening, just like a glass blower blowing its glasses.

It was there and then, in the factory that I was produced that I finally came to life, and where the journey started that I was about

to embark on. I felt such comfort in that factory, sharing my life with all the other bottles produced and I had such high hopes for my upcoming future. Once leaving that factory, my journey has turned out to be far from a straight road. I've had my ups and downs, hit my lowest lows, while also experiencing some really great moments. Even though it might feel like I've lived an entire life, it has only begun. While the generations of you humans will change like seasons, I will live on. But you will be far gone to experience that, so I will share with you what I have experienced so far. Let's begin with my very first memory!





363 Million metric tons plastic produced each year globally according to statista (2022).

Statista (2022) keeps stating that plastics versatility has made it displace other materials, mostly materials such as metal, glass and wood.

Plastics can be formed into multiple products and textures such as polyesters used in fabrics, polyvinylidene chloride used for food packagings for example and polycarbonates in discs and sunglasses among just a few things that plastic is used for, Statista states (2022).

- To produce plastics:
1. Gathering of raw material.
 2. Manufacturing a basic polymer.
 3. Compounded into useful fraction.
 4. Plastic product is molded and formed, demanding extreme energy-intensive process throughout.



- of the transportation load according to Gilbert (2017)

The birth of the bottle

I started my journey in a factory together with tons of other bottles, all sharing the same quality of precision. Something that one would call a resemblance to perfection. I felt a huge pride knowing that I would serve a human with the water that I carried, and that it was with such purity.

The newly produced bottle, also known as myself, was soon after the manufacturing, placed in a carton of a bunch of other bottles. There was not a sense of loneliness in the world. We were put together in a mens of comfort and protection. We were a collection of perfectly inspected and chosen bottles that had all passed the test of precision. Where any deformity wouldn't certify the standards of our humans.

Here we were, perfect and limitless. Produced from earth, made out of human innovations, and carrying the existence of life in our bodies, a basic need for human beings. The thought of not only being accomplishments of precision ran through my head several times. That we are extremely lightweight, even though we can carry more than many other

materials. We are durable and long lasting, yet still cheap to produce. There was nothing that could stop us from achieving great things.

I had nothing but hope for the future. The plan was to serve my human. Letting the human that chooses me, to drink my water so I can help that person stay alive. These plans consumed my whole time in the factory. The proudness of my destiny was so abundant it almost absorbed me. I was fantasising about the life that I would have outside of these walls. How the human would treat me and what journeys we would take together. Hoping to build a long friendship and to fill that same longing in the human that I was feeling for it. There was nothing but excitement rippling inside me.

Reflection:
In the construction industry many of us tend to see plastic as a material with endless opportunities and recognising it for being clean, durable and cheap. No wonder it used to the extent it is. It is a great material that deserves more credit than being used for single-use which only further implies that plastic is a exchangable and insignificant material.

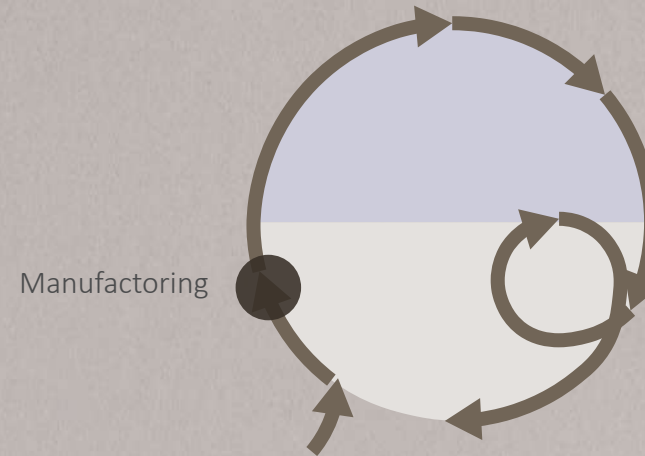
A hint of the outside world

Looking outside of the factory I was produced in, I was baffled by the contrast of the clean and hygienic factory, and the polluted and dirty world outside. It was my very first memory I had of fear, and perhaps that's why I remember it so clearly. Fear of what I might expect in the outside world. Maybe it isn't as pretty as I have imagined?

In the cold and dark factory, one early morning slowly set the scene for the rest of the day, making me remember this particular instance. In the comfort of being surrounded by excellence and superiority, I felt at peace, longing for serving my purpose.

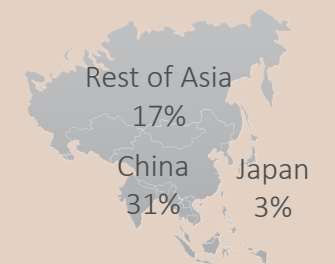
The first workers of the day were arriving. When the doors were opening and a human was lagging behind, making the doors open for an instance longer than usual, I was able to get a glimpse of the outside world. In contrast to the sterile environment in the factory, I was baffled by the brown smog surrounding the door opening. In contrast to the clean and shiny factory, the outside is anything but that. Was that what the outside world looks like? Air that previously only had been filled with excitement thickened with humidity that slowly spread across the room, and my transparent body fogged up. The filth lingered in the air and the mist suffocated every pore of my body, a new sense I wished to never experience again struck me. A snug sense of constriction and suffocation. That outside world was not for me, I should belong in a safe space such as the factory, where everything is in order. Where everything is chosen by purity and wholeness.

As soon as the doors closed, the humidity dissolved and a breeze of air conditioned air alleviated my thoughts. It was a short moment of fear, that only lasted for a short instance. So short that it might not even have counted as fear. It might have only been a mere suspense of uncertainty. At this point I couldn't possibly know what fear was in my safe space in the factory. All I knew was that I wanted to be surrounded by equals, by humans that valued the same understanding of cleanliness and structure as myself.



51 percent of the world's plastic in 2019 was generated in Asia, according to Buchholz (2021).

World's plastic production in %:



China which produces 31 % of the world's plastics, produces 82 kg per capita, whereas Japan, generates only 3% of plastics, but produces 88 kg per capita.

According to Ecology Center (n.d.) pollution caused by the production of plastic resin is less visible than plastic pollution, but still very serious.

Ecology Center (n.d.) further states that a 500mL PET bottle emits more than 100 times the harmful emissions into the air and water as a glass container of the same size.

Plastics production can also be hazardous to workers. Explosions, chemical fires, chemical spills, and toxic vapor clouds have all occurred in serious incidents.

Reflection:
Being aware of materials production phases could be one of the most important steps to ensure material dignity, since it sets the preconditions for the materials continuing life cycle. All materials are being processed, and so we have a responsibility making sure that materials are being produced healthy and sustainably, giving opportunity for well recyclable products.



Starting now

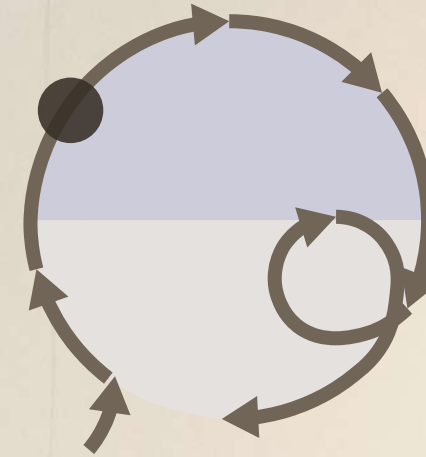
Being transported to the new world where I was going to fulfil my destiny was a humble feeling. Soon I was about to serve my purpose of being used by a human. I was filled with excitement as I carried the water that sustains human life. I knew I was destined for something greater and soon everything was going to come true.

A while later, the moment came when I was finally packed into a plane. Leaving that dirty place, and knowing I was on my way to something greater. Even though the darkness I was packed into made it impossible to see, I was closely packed together with my friends and we were soon about to start our lives. I was filled with anticipation and nothing could ruin this moment. I was finally going to be shipped to a world of greatness, where I will finally fulfil my purpose. I knew I was destined for something greater than the world from where I was produced. I knew that I was destined for more. Carrying my water that sustains life, to a human that needs it. Someone that cares about me and my great quality.

Someone that recognises my potential. Feels good to be leaving the brown smog, where dirt is spreading with the air. It is a relief to go somewhere where I belong, with humans that share my values. It is with great curiosity that I am entering the next chapter of my life. One step closer to fulfilling my destiny.

As I was getting packed off the plane, I saw my new world unfold. Could it be true that it was everything that I was hoping it to be? The air was as clear as my future hopes. The surroundings were as clean as my headspace and the humans seemed to be as bright and lucid as my destiny. There was nothing more I could have asked for.

Transportation



Positive qualities of plastics according to Psarra (2009)

- Lower energy costs than many other materials.
- Low density material, requiring less material of a product, which also makes transportation less energy-consuming.
- The process of molding plastics makes it a very versatile material, being able to shape it into almost anything.
- Thermoplastics is highly recyclable.
- Easy to produce coloured products, which is not only good for aesthetic purposes, but also for identification purposes. For example labeling pipes and cables, to simplify work for construction workers.
- Has a wide range of materiality, being able to produce different surface finishes, to also simulate other materials.
- Generally good insulators, for example thermally and electrically.
- Strong and flexible. Can even be made stronger than many metals.
- Many plastics are chemical and solvent resistant. While some also can be made water soluble.

Reflection:
Even though plastic is viewed for its many benefits when new, we still seem to think that it is lower valued than most other materials, like wood and metal. Plastic however doesn't need to be used in the same way as those materials, and we somehow want to minimise the use of plastic where it is not necessary. Packaging and single-use should however be prohibited and could be achieved by design decisions in the beginning of the design process.

For just a dollar

Soon thereafter it happened, the greatest moment of my life! A human bought me and I could finally be used the way I was supposed to. The water left my body like tears of joy. I emptied, not just on fluids, but from the relief of fulfilling my destiny. Finally I was free, and could live my life the way I wanted to.

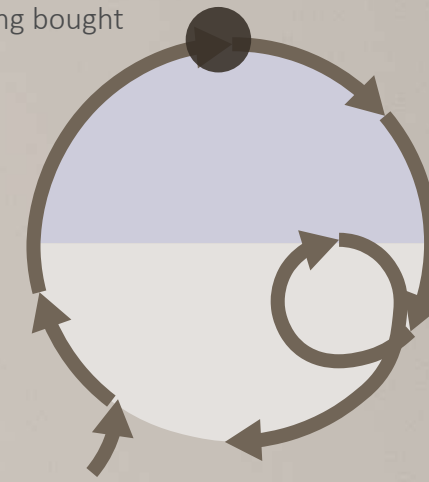
When the time had come for me to serve my human and fulfil my destiny I felt humble, but I'm not going to lie and say I wasn't a bit nervous. I was not sure if it was the cool fridge I was in or my nerves that made me feel shaky and fuzzy on the inside. It was going to be the greatest moment of my life, so of course it was a bit apprehensive. But it was with great excitement that I had these feelings.

I sat on the shelf of the cool fridge when a young female approached me and picked me up. She looked warm and tired, looking to quench her thirst. A single line of sweat seeped down her hairline. It made me feel so wanted, knowing that I could help her feel more at ease and fulfilled. Her warm hands around me were tight, but firm. The condensation from my cold body dripped on her hand but didn't seem to bother her. It seemed like I was the only thing she needed from the store, which made me feel even more appreciated.

Once I was bought and taken out of the store I was directly opened and drank from. The water left my body, like tears of joy. I emptied, not just of the fluids, but from carrying that anxiety. I started to feel free and relieved. That human needed me, and I needed that human. In perfect symbiosis we soothed each other's discomfort for a short while. And then I became me. Without having to carry all that water, I was finally just myself. No one else, but just me. No baggage and no load. I had done my duty and served my part, now I could live my life the way I wanted it to be.



Being bought



McKay et al (2020) states that plastic is usually perceived as a hygienic material, where it easily can be replaced and disposed when used. The material has many benefits when new, however the plastics life length is usually very short. Today 40% of plastics are used for single use, mostly for packaging. This also relates plastics to the connotation of being almost invisible. A material that does not really exist and doesn't have any value after serving its purpose.

The perception of plastics is very much related to the politics of perception in the global market, where plastics is deliberately marketed as common, making it widely exchangeable, without its personal story. According to Foote et al (2012) large corporations make it a market strategy to make it a choice of freedom to choose plastics. Placing the responsibility on the consumer and not the producer.

They further state that this is making sure that we as consumers distance ourselves from the impact our economic choice has on the land and other people. Which also means that we distance ourselves from the object's history and future, which is altering our perception of the product.



Reflection:
Often consumers go with the easiest and cheapest option, since we as humans are lazy by nature. Just by preparing, putting a little bit of effort in, it is possible to make better and more sustainable options. As an architect, it would be profitable to spend some time in the beginning of a design process to plan and research about how to use materials in the best way possible.

A soggy garbage bag

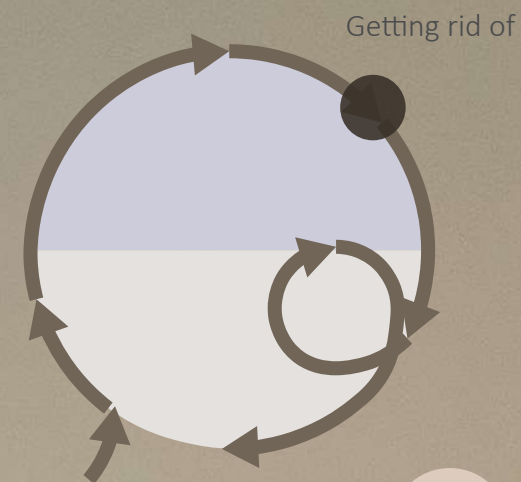
Here I was, thinking I had the whole world in front of me, but instead of being free, I was placed in a dark and moist place. The void that moments ago felt like tremendous freedom, now started to feel like a big hollow inside of me. This wasn't where I belonged.

I was not ready for what was about to happen to say the least. Here I was on top of the world, thinking I had the whole world in front of my cap. I was not just wrong about my highly hopeful future, but I was deeply mistaken about the whole system I was born into.

Once I was emptied and finished, when I thought my life could somehow start for the better, I was instead thrown into a cold and moist place. Not like the cold fridge I was previously put into, but a smelly, dirty place. I did not know what it was, but I recognised the smell from when I had looked outside of the factory. I felt the shivers going down my body. That void inside me that just moments ago felt like the biggest freedom, now started to feel like a big hollow. Like a big nothingness of cold. It made me feel lonely and empty, like a piece of me missing.

When the light broke into the darkness I could see all the other products being placed in here. They were just like me, but stained and smelly. What had I done to deserve this? I didn't belong there? I was created for perfection, chosen out of the very best. I was supposed to be immaculate and here I am being placed with some questionable types. With my emptiness and hollow core I could feel dirt crawling up my body, staining my previously so clear surface. Am I to become just like these products?

It is difficult to say for how long I was in that hole, but it doesn't really matter. What I do know is that it felt like forever. The longer I was down there, the more I was stained by the products in that hole. I didn't only lose track of time, but of myself. It didn't take long for me to be beaten down and look more like the other products, than the former glorified version of myself. At this moment no one could ever believe that I used to be more transparent than water itself.



All single-use plastics which is used for only a few seconds, yet remains on the planet for hundreds of years, according to staff (2022).



- Nearly 91 percent of plastics manufactured are not recycled

- Every year, around 14 million tons of plastic ultimately end up in our oceans. Many nations lack the necessary infrastructure to combat plastic pollution.

- Almost every item of plastic ever created still exists in some form or another, Staff (2022) keeps stating.

Some of us feel good about simply throwing things in a recycling bin, as though we've done our part to help reduce plastic waste. According to MDS associates (n.d.) consumers have a far more important role than we might think. A recyclable having food residues on it, is damaged or lost some of its quality, cannot or will not be recycled. It's deemed useless and thrown in with the rest of the garbage that ends up in landfills or incinerators.



Reflection:
When a building has served its purpose, doesn't mean that the materials and products have served their purpose. Unfortunately we seems to consider those things the same, but that is not always the case. Realising that, and considering how to separate the two can be a great lesson on how to achieve material dignity.



Capsized

When I had the chance, I escaped the dark and damp place and found my way into the waters. At this point I could see my body that previously had been so clean and uncontaminated, but now it was anything but that. Who would want me now? And it was clear no one did, I was all of a sudden treated invisible, where everyone that passed didn't seem to acknowledge my existence.

All of a sudden something happened. While being on the move, the place we were put into ruptured and a hole emerged from the bottom. I saw it as my chance to escape and exited the damp spot. Out into the world once again I was thrown onto the ground. My body started spinning and in a rolling motion I set target at the already familiar water. There I might be able to find the piece of me that was lost when I was emptied of the precious fluid.

I could finally see my body all so clear, bathing in that cold water. I was not just stained, but had roughened, bumpy surfaces throughout my body. That clear, clean and hygienic body, could impossibly ever be the same. Who would want me now? I'm not even worthy of the dirt.

As I travel this huge piece of water, I keep getting further and further away from the land. This only makes me feel smaller and smaller the further away I go. Here I am, lonely and deprived of security, without any sense of where I am going. All humans that pass both onshore and on boats don't seem to notice me. They treat me like I'm nothing, like I don't exist. I just don't understand, is this what my life is supposed to be from now on, living a life in invisibility?



When used, plastic prove to be fragile, quickly roughened and cracked, while also attracting dirt according to McKay et al. (2020).

According to Foote et al. (2012) all we want is to make the plastic waste to go away. Picking waste on a beach and then throwing it in a bin, soothes our guilt and helps with our ethical duty and obligation of helping the environment. But still we are just putting it away, making it invisible, instead of dealing with the real issue.

- At least **363,762,732,605** pounds of plastic waste are in the world's oceans as of 2021 according to Staff (2022)

- **2050**, There will be more trash in the oceans than fish (by weight), Staff (2022) further states

- About **1 000 000** marine animals gets killed by plastic contamination each year, Staff (2022) argues. Animals that consume plastic frequently go hungry because the plastic hinders them from properly ingesting food.

Reflection:
Once we start seeing used materials, not for its lost purpose, but for its properties and qualities, we can start working with it in a different way. It goes very fast to go from new, to used, while still being the same material. It is all economical and time reasons for not treating it the same, which is too bad, since nothing about the product has really changed.

Bridging

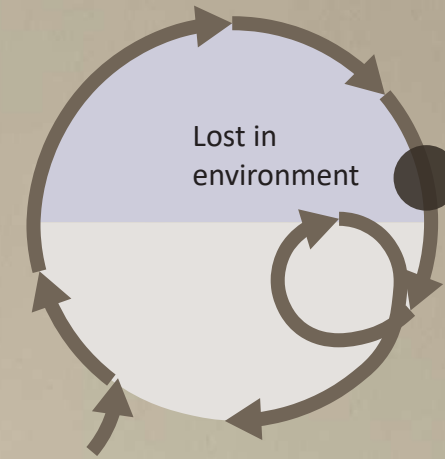
As I float across the water I seem to pass something that seems far from related to me, but still feel familiar. It is a bridge that shares the same materiality as me, but even so, looks just like timber. I find it funny why something plastic wants to mimic another material? Is the bridge not proud of itself, trying to convey itself as something else?

Once I get to communicate with the bridge I see that we have a lot in common. It was once going through a similar journey as I am going through at this point. It was once many different plastic products, which were collected after serving its purpose and later moulded into new parts and being put together into this bridge.

The bridge explains that this process of putting together plastics and forming it to something like the timber looking plastic can be extremely sufficient. It is apparently stronger than regular timber, more durable and can stand water way better. It has also given all the plastic a second chance of fulfilling a new destiny. It is also apparently so that this bridge can be recycled and given more chances in the future, if the bridge were to be taken down.

Even if the bridge mentioned all these good qualities, I noticed a sense of inadequacy in its voice. When asking about it, it seemed like the bridge still didn't feel worthy enough. Considering all the benefits, it was still not given the attention that regular timber got. It felt like a betrayer for not looking like plastic, and a fraud for pretending to be something it is not. It doesn't matter how much it actually looks like timber, it will always be regarded as the second best solution, like a fake, it explained.

The Plimber bridge made me feel more confident that this is not the end of my journey, but at the same time I keep questioning my existence and the reason why I was being put into this world.



Rutgers University (2016) researchers developed structural plastic lumber, which is produced from recycled milk containers and coffee cups. It is apparently "lighter than steel, longer-lasting than lumber, and strong enough to support 120-ton locomotives."

Structural plastic lumber has been used in construction projects around the world since its debut, but is still somewhat unrecognised, Rutgers University keeps stating (2016).

Benefits according to Belson (n.d.):
- Better structural strength compared to treated wood lumber of equivalent dimensions.

- Any tools suitable for working with actual wood can be used to work with this material.

- Resistance to moisture, fading, insects, splinting, and warping is exceptional.

- No need for waterproofing, staining, or any regular maintenance.

- UV pigment system with high color stability that keeps its look for years.



Reflection:
There are so many inspiring ways of working with a material as plastic, and ways to work with recycling. Some that can solve several problems. However it feels like they end up in the shadows, because of our perception of it being quite invisible still. So unless we change our perception of plastics, these types of solutions might not be mainstream. Only we can bring light to them

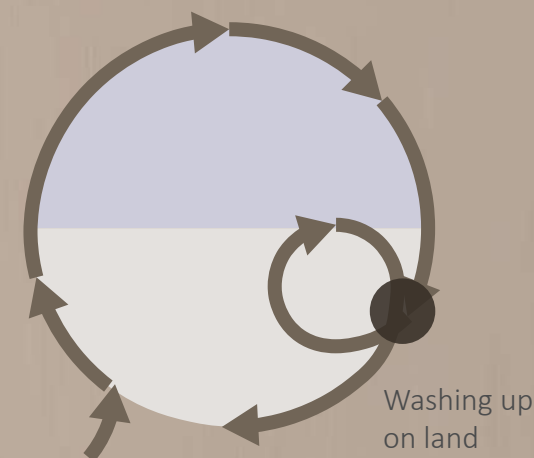
Not seen, not existing

Eventually I hit shore and as I layed there in my loneliness I noticed a human taking notice of me. I started questioning my own insecurities and thought that maybe someone wanted me regardless of how I looked. But of course these thoughts were a mere string of hope and nothing else. Once again I was thrown away and out of sight of the human being.

After having floated for many suns and moon rises, I unexpectedly hit shore. As I lay there, watching humans do their business I all of a sudden see a person taking interest in me. The thoughts start running in my head and I start believing that this is finally my time to get a new purpose in life, and maybe become a Plimber bridge myself. Could it have been my inner insecurities talking since I ended up in the dark garbage hole? Maybe there is someone who actually wants me regardless of what I look like, and that I was just too lonely and scared to see the good in humans?

The human approached and carried me away. This act, that for me was pure happiness, made me give off a sound as the human squeezed me between its fingers. Like a jolt of euphoria trying to escape my body.

This delightment was however shortlasted. Instead of getting to serve another human, I was once again thrown into a new dark hole of waste. Once again let down to rut. And this time I will probably not be as lucky to escape, that would be some extreme luck. And it is after this that everything became dark from the bin and from within. To go through this once was bad enough, but to be identified once more as waste, and being taken away the opportunity to experience the world, takes too much from the spirit. There was no longer anything left from my former identity. I was trash. I was nothing. I was not worth anything. And when I thought about it, maybe I was never worth anything? Maybe all I was, was nothing. The water that I once carried was the thing of value. I was just the carrier. The piece of material to hold it in place. I never had any value, that wasn't me. It was the water. It was always the water. I have never been anything. No wonder why they keep just getting rid of me and ignoring me.



Foote et al. (2012) argues that as consumers, producers, activists or members of society we are basically asked to consume, but at the same time separate ourselves from waste. We believe it to be normal to use plastics for everything, yet do not want to associate ourselves with its by-product.

The fantasy of our culture's good life conceptualises the waste as something we should hide and not confront, instead of asking ourselves if it is a problem that we as individuals can do something about, Foote et al. (2012) keeps arguing.

Even so, according to Oceanwork (n.d.), many global efforts are being done to minimise plastic waste and has proved helpful. International endeavour helps to safeguard marine life, decrease pollution, and lessen dependency on virgin plastics. This can benefit collecting communities by directly promoting the removal of plastic garbage from the local environment, as well as providing new sources of growth.

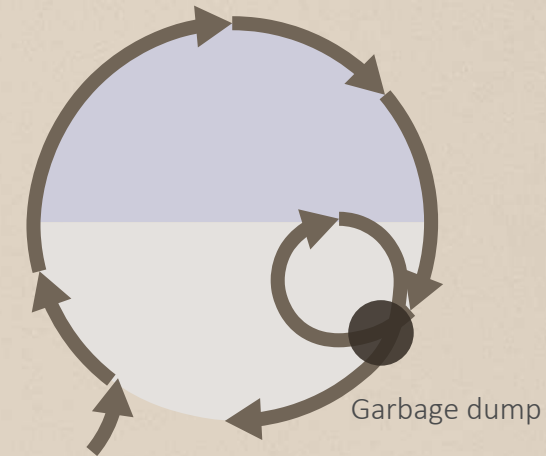
Reflection:
Unless we can start forcing the market of working with old plastic or less valued materials we won't see a change in how we work with these materials. It is not until we show new benefits of working with them, that we can influence the market. Whether we can find new economical benefits or some other values, we are the once that can make these changes, which should be seen as a huge honour.

Go back three steps

As I ended up in a dump of other products just like me, I started noticing the people having to live next to us miserable beings. I could sense that their self worth was reflected by our presence. I was created to take care of humans, and at this point my sole existence is shaping their lives negatively. This made me question my whole life's purpose.

Once I was let out of the dark bin once again I was apathetic. Indifferent to what was going to happen to me and where I would be taken. Whatever happened it wouldn't matter. No one would want me anyways and would only find a new way to get rid of me, so they wouldn't have to acknowledge my existence. All I could do was to just exist. I was never going to be able to have any new purpose the way I was rouged and stained.

I ended up on top of a large garbage dump. All objects surrounding me seemed to share the same indifference. We had all been going through similar journey's and were beaten down by the way we've been treated along the way. None of us looked like the way we used to. Many had even been broken into several pieces, or lost all their colour. It was a sad view. Felt like a cemetery for products like us.



Not far from the dump that I was a part of, lived a few human families. They lived a completely different life than the life I experienced in the beginning of my journey when I landed with the plane. Since I now couldn't cope with my own existence, I instead focused all my attention on these humans. It made me faint-hearted watching these people having to share their life with us low-life products. The longer I viewed their simple life, I recognised that their self worth is the same as mine. I could sense that my, and all the other products in the dumps presence was reflected

in their own self worth. The dirt and waste was staining their own perception of themselves. As if they believed to be a part of this dump. And that's what made me once again fall even harder, and made me feel more destroyed than ever. I was created to serve humans. To nurture their existence, giving them water to sustain their lives. My identity was to take care of humans, and now here I was tainting their lives. I went from good to bad. From protagonist to antagonist. My sole existence was shaping these peoples' lives for the worse. Why do these people have to have me in their lives? What have they done to deserve such bad influence? What has given them this destiny?

From what I could tell these people didn't even buy any of these types of products, and even so they were the ones having to live in the waste of other people's consumption. If I had hit the lowest low before, I was at this point even lower, thinking about the impact my presence had on these humans.

Cotta (2020) states that given the estimations for 2050, it is evident that inequalities in garbage collection and treatment, particularly in the Global South. Overconsumption in the Global North produces large amounts of waste, which is frequently dumped in the Global South. The costs of the environment and health are therefore unequally distributed, with the Global North exporting dangerous chemicals and materials to the Global South.

According to Vázquez (2016) the increase of people living in extreme poverty has led large groups of people to seek living in waste dumps, with the serious health concerns and heavy stigmatisation that this entails. These people seem to have difficulties interacting with the rest of their population as a result of the stigma they face, and have developed a distinct lifestyle that isolates them from it, which may contribute to the worsening and continuation of the stigma they face. These believe that the rest of the population are viewing them poorly because of their living and livelihood.

Reflection:
We often forget that our consumption as a society has its impact on other parts of the world. If we start recognising that there are impacts to our choices, seeing how we can design sustainably and using the resources available in the best way possible and carelessly we will treat materials more respectfully as well. It all ties together and if we untie one knot, it will have a greater impact later down the line, positively affecting the people having to suffer for our consequences.

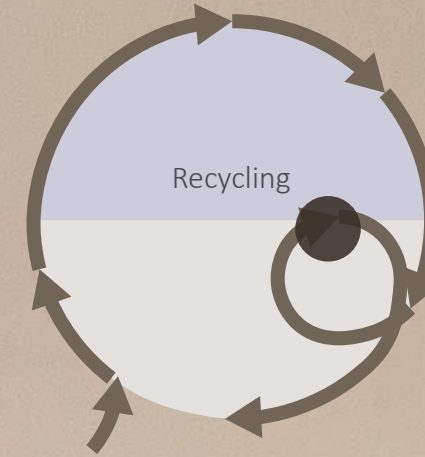


Found: a new purpose

Existing in a mere void of negative thoughts, blurred out any definition of time. But one day I was being removed from the dump site, taken to an unknown location. Out of nowhere I was suddenly being washed and cleaned. Before realising I was all of a sudden heated and remoulded. I had been given a second chance in life, given a new purpose, one where I could serve new humans for another cause.

The act of just existing blurred out any definition of time, but one day all of a sudden things started to shift. It all started when I was suddenly being picked up and thrown into a container. Not as dark and hollow as the other times I've been thrown into something. This time was different. After being transported to another location and being stored in the container for a while with tons of other plastic bottles similar to me, I was packed and thrown into another wet container. Without realising I was getting washed. A human, with its bare hands, washed me and removed the dirt from my body. It was too surreal for me to believe. In complete disbelief and disorientation it was impossible for me to even enjoy the experience.

Once washed I was later in the stages of being moulded and created into something new. Still confused, I tried to grasp the situation that was



happening. Trying to understand the implications this would have on my life. It wasn't until everything had settled and the process was over that I could comprehend everything.

I had gotten a second chance in life. Turned into something new. I was now a piece of a building. A component to something greater, something of value. I'd been formed to have a purpose, a new self-fulfilment. From what I can remember this was the happiest I have ever been. For a long period of time I would serve my humans again. I would not be looked down upon, but with grace and dignity I would be appreciated.



The challenges associated with plastics have contributed to a shift in public perceptions of the utility of plastic, according to Foote et al. (2012). This shift in norms began in the Global South which is intriguing, as it calls into question the widely held belief that industrialised countries are generally environmental leaders.

Foote et al. (2012) further states that the citizens in Dhaka, Bangladesh, pushed for stricter plastic bag regulations as early as 1992. Similar citizen participation on this topic is now being seen in a rising number of places across the Global North. This shift in attitudes is the result of a series of localised campaigns in various communities throughout the world responding to specific local problems, rather than a globally coordinated campaign against plastics.

It is easy to believe that our plastic consumption has no effect on anyone other than ourselves, when in truth, it has a negative impact on those who are already struggling to survive.

Reflection:
Recycling building parts is something we should strive for, but to do it in the right way. If we start looking at how to build and design for easy disassemble and making sure that we don't have to throw away functional products when the building has served its purpose, we can avoid so much materials going to waste, and be more cautious when it comes to how we treat the materials.

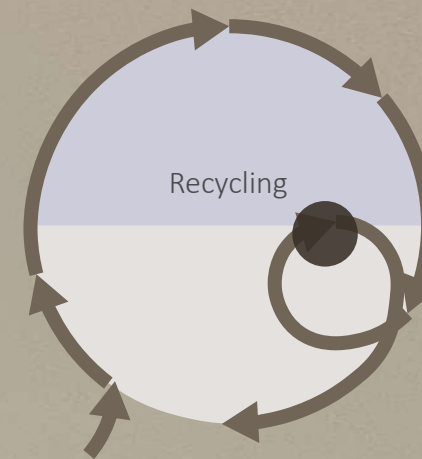
Nevermind

As I had gotten used to by this point, it didn't come as a surprise when I realised that nothing good came out of this new purpose either. I started noticing the toll the procedure of remoulding me had on my body. I am no longer the same as I understand that this is the end product of my existence.

As expected, with every step forward, comes two backwards. Just as I had gotten used to throughout my journey. This didn't come as big of a surprise as the other times though. What could I suspect, that my life now would become totally meaningful all of a sudden, after realising that I don't have any real value to humans?

Even though I still serve my purpose and feel proud of it, I need to mention the toll the process of being formed into a new object took on my body. I am physically no longer the same as I used to be. Even though my journey took a lot of beating to my body, I was still the same. The sun had damaged the quality of my body a bit, but I still had the same materiality. But after this recycling however everything changed. I was now damaged and mixed into something irreversible. Blended together with other plastics and materials, which makes me weaker and more fragile. This was the endpoint for my recyclability and I felt it straight away. I am too weak to undergo another process like that.

I knew that life had increased for the better, but the question is for how long? And what would happen after that?



Dutta et al. (2016) argues that since plastics contains a wide range of additives, it is impossible to establish consistency in the quality of plastic trash when recycling, which is one of the main concerns. One way of handling this would be to sort plastics by type, however, this is a labor-intensive task, and the cost would be substantially higher than acceptable.

The majority of plastic wastes are also usually filthy and contaminated, creating a barrier to recycling. Furthermore, some of the plastic wastes have been discovered to have degraded to varying degrees when once thrown away. Plastics, unlike metals, also deteriorate after recycling, which is why the phrase "down-cycling" is commonly used, Dutta et al., (2016) keeps stating.

Most people believe that, like paper or glass, plastic can be recycled indefinitely without losing its quality, according to Krososky (2021). The truth is that plastic is continuously downcycled until it can no longer be recycled. The majority of the time, it ends up in a landfill, where it slowly degrades into microplastics.



Reflection:
In today's society and as architects we seem to think that if we are able to recycle something we have made a huge difference towards the environment. I seem to think of it as green washing in some instances. Recycling plastic will always be downcycling for example. If we don't recycle with the intention of storing the materials quality, we are ruining something that could serve more purposes.

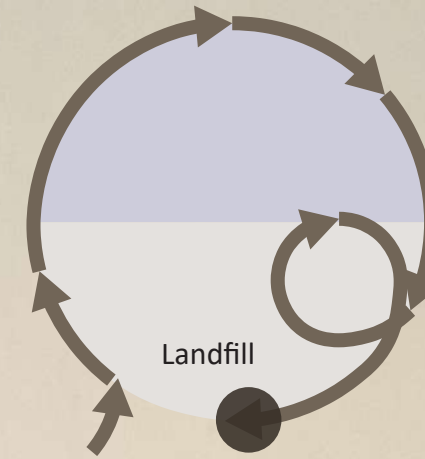
End of life

I served my purpose in a building for many years, but eventually my fears became reality. I was brought to a landfill, no longer being useful for anything. This was it. It was the human way of defining end of life. Still I know that I have hundreds of years yet to live and will outlive any human living on this planet today.

It would take a few generations of humans for me to get the answer to my question and I was very pleased about it taking so long. But I knew the day would come, when I had served my purpose at the building as well. And it did. It wasn't an easy day, but somehow I had spent so much time preparing for it, knowing it was inevitable, that I felt indifferent about the whole thing.

I was brought to a landfill, since I no longer could be of any use ever again. This was it. This is what humans define as the end of life for us. Where we spend the rest of our days. What makes me so sad is the realisation that even though this is the end of life stage for me, I still haven't even lived one tenth of my life yet. I will live on, while the humans that created me and used me will be long gone when I am fully submerged into the ground. Who knows if I ever will be?

Still humans are the ones to decide what happens to me. To bring me life and do whatever they want to me? Leave me here to rot, without it ever being their problem. Who's to say that they got the right to bring life to me, just to give me a second of joy, and a lifetime of misery?



Shouldn't I deserve better? I am the one not leaving the planet, the one being stuck here. It feels like just as long I am out of your sight, I am not your problem. That for you, my higher purpose is to disappear. To degrade or dissolve is the only thing you want me to do, while I can't. And so you just have to store me, somewhere where you can't see me anymore. If that is all you want, then why did you produce me? How can it be justifiable to produce me for such a short purpose, to leave me like this and let me take up space for nothing?

So while I live on here in my pile of waste, I want you to sometimes think of me. To think about where all the plastic you use ends up. To consider if it is worth purchasing plastic for some easy or cheap applications, or if it is worth contesting the way you consider plastic in today's society. Plastic is a rather new material that you didn't use many decades ago when making buildings, so I am sure that you can do without it today as well. Maybe it is worth that extra money, or extra research? Just please consider it, and don't just accept everything without critically reflecting on these issues first.

According to Depountis et al. (2008) many locations across the world are running out of landfill space as a result of waste resentments coming from public view of landfills and environmental difficulties. A landfill scarcity disaster is on the horizon unless the tons of garbage disposed of to landfill are effectively and quickly decreased.

The primary environmental problems posed by landfills are emissions directly into our waters or into the atmosphere, Depountis et al. (2008) keeps stating. Emissions include dust, noise, odor, and perhaps bio-aerosols, as well as landfill gas, that will last for hundreds of years. Water emissions may include landfill emissions and polluted water into our streams.

Dutta et al. (2016) states that incineration of plastic trash with energy recovery is a feasible option. Municipal solid waste incineration in connection with a district heating system is relatively popular in Northern Europe. Sweden has a high percentage of material recycling (37%), as well as biological treatment (12%). Household garbage (approximately 47 percent) is often burnt via waste-to-energy conversion, which generates heat and energy.

Reflection:
Eventually all waste will end up in landfill (or be incinerated) and it is important to consider that plastic will be stored there for hundreds of years. Its life doesn't end when it reaches the landfill, but will keep on existing. If we as architects recognise this, it would help us to be more cautious about how we use materials when designing, since we would be more empathetic towards its existence.



GROUNDING

The story presented was an investigation to explore material dignity and to see if my perception of plastic as a material would change throughout this process. The storytelling, or what might also be similar to story-compiling, is the method of this thesis which will be further explained in the later stages of this thesis.

Introduction

Dignity

/'digniti/

noun

1.the state or quality of being worthy of honour or respect.

"the dignity of labour" (merriam webster, n.d.)

The term material dignity is defined in this thesis by the way we as architects should consider what is the most worthy and respectful way of treating a material, and only use it where it serves its purpose the fullest. To be conscious about the materials' whole life cycle, and see the impacts it has on our environment and society in all phases, from production to beyond the end of life.

As architects our job is to make decisions regarding all aspects of design, to consider different factors to make the best possible outcome with the conditions we are given. When it comes to material decision making, we usually base our decisions on its aesthetics, strengths, costs, impact on the environment and many other factors. These decisions are usually influenced by the previous knowledge we have about the material, our own preferences of esthetics, what trends there are in society, or overall what society believes to be good or bad at the time. Often we even go for what we are most familiar with. It is important to think further and question how we use the resources available. We should be more involved and aware of the way we think and act when designing. As architects we can no longer oversee our responsibility for making sure that we use the materials in the most proper way possible, making sure we know the impacts of our decisions.

This thesis will explore a new method on how to understand materials in another way, uncovering layers of preconceived notions and see why we should and how we can challenge the way we perceive materials, to make sure our decision making does not influence the materials dignity.

To understand materials dignity this study will look closer at plastics, using it as a reference, to discover as a starting point, how we as architects view plastics, and how it can be changed in terms of perception in order to use it more sustainably and respectfully when designing. Plastic is one of those materials that has many good qualities when new, but also very destructive to nature when it has served its purpose, according to Dalberg Advisors (2021), which is why it is a favourable material to explore.

Purpose and aim

To dig deeper into the perception of materials and see how that can affect our way of using the material, the aim of this thesis is to investigate if architects can become more aware in material and product decisions when designing, by using storytelling as an alternative method of analysing data.

As with every design process, the circumstances are different depending on the context, site and client etc. That is why it is not appropriate to suggest just one solution that fits all different situations, but rather to explore a different method that can help architects assess material choice which can be applied to any situation. This is preferably done in the initial stages of a design process where the perspective of material dignity could have the biggest outcome. Where design would have to follow the principles of material dignity and not the other way around.

According to the theory of *Histories of the Dust Heap* by Elizabeth Mazzolini and Stephanie Foote, our perception is biased in the way in which our culture is shaping our beliefs, which will impact our further understanding of how people use and treat the materials architects use when designing. It is not until we as designers understand the full content of how these cultural norms shape our perception, that we can get a proper understanding of the situation. This thesis doesn't aim at telling someone what decisions to make, but rather to explore a new way of how to get to those conclusions yourself and finding a new way of analysing data.

The purpose is to discover both positive and negative properties, find correlations between societal norms and the way architects use plastic and find new perspectives in how to present data in order to uncover new layers to the materials potential.

Research Question

In order to evoke change and challenge the perception of materials, in order to establish material dignity, the question this thesis will focus on is:

How would storytelling be used as an alternative method for architects to use in order to influence decision making when it comes to making more conscious decisions and actions, using plastic, to ensure material dignity?



Delimitations

This thesis will delimit the study to only one story, made by one person, which is myself. Because of time limits it would not be possible to write more than one story, and having several people trying out this method. The amount of data that would have to be collected and processed would go beyond the time limit of this scope. This of course challenges the validity of the results, but the aim is to see whether storytelling can foster self reflection and a change in one's perception.

For the same reason, only one plastic (PET bottle) is being used as an example, instead of going into several different plastics and their different properties and life cycles. Important to highlight that this thesis focuses on the principles of self reflection that is made by challenging one's perception through the storytelling method, and not the details about different plastics in the same sense, even though the facts are important to get a better understanding. Thus chemical properties of plastics, and going into what types of plastics there are and exactly what they are used for goes beyond the scope for this thesis.

The bottle is a product and not a material, and is however still chosen because it shares the same perception as most plastic material products, which ultimately creates the general perception of plastic. Once again it is the social view and cultural connotations that are explored, and not the product itself. The story starts when the material is formed, and will therefore exclude any previous process of how the raw materials were extracted and processed before the birth of the bottle.

This thesis focuses on the architect's perception of plastics, from a westernised perspective. Since the narrative of plastic is closely linked to our cultural identity, it still is a quite general perception of plastics within the western societies. The thesis will not cover any solutions on how to tackle these issues within the industry, but rather explore an alternative method that possibly could help how to come up with those solutions and conclusions yourself as an architect in the future.

Challenging the perception of plastics means dealing with all aspects of sustainability, however this thesis will not go into detail about the three sustainability aspects, but rather recognise the consequences our actions in today's society have on the environment, people's wellbeing, and how the economic market is shaping the way we use plastic.

INCLUDE	NOT INCLUDE
Storytelling	
One story, one writer	Several stories and writers
One plastic product (Plastic bottle)	Several plastics
One plastic lifecycle	Several lifecycles
Perception	
Architects perception	Consumer perception
Plastic as choice of material	Solution solving plastic crisis
Plastics	
Plastic qualities	Chemical properties of plastics
Non-degradable plastic	Biodegradable plastic
Common lifecycle steps of plastic	Exact life cycle of specific plastic
Sustainability	
Environmental	
Social	
	Economical

Context

This thesis is based on a cultural context that on how we perceive materials based on the culture in which we live. IGI Global (n.d.) argues that cultural context refers to the society in which people are born and how that culture influences their behaviours. It includes taught ideals as well as attitudes that are shared by groups of individuals. Beliefs, ideas, meanings, customs, language, and norms are all part of it.

According to Chintha & George (2012), the cultural context of this thesis is based on the western ideals of consumerism and globalisation, and how these factors promote unsustainable thinking about plastic as a material. Globalisation has had an impact on the social, cultural, economic, technological, and environmental aspects, as well as fostering identity shifts and new forms of subjectivity. While globalisation is this current era's main ideology, consumption has become the source of its prosperity. Consumption as a modern behaviour encourages new types of identifications such as self-expression through living pleasurable lifestyles.

It is not until we as architects understand our own patterns and cultural frameworks, that we can dig deeper and see how it affects us in our daily life, and not only as architects working with these materials. The act of telling the story of a plastic bottle, rather than a construction material, makes us look at our own way of perceiving through the lens of our own societal ideals, rather than just what we do in our profession and how it is perceived there. When we have discovered how we function as people, living in a western society, and how that affects our ideals and beliefs, we can then bring that with us to our profession and it will have a farther impact on the outcome.

Background

According to Psarra (2009), peoples perception of things, and the narrative in which they live by, is what one might call cultural identity. What is believed to be reliable, realistic and true information in society, as a group of people or community sets the precondition for this identity. So however this narrative is being portrayed, is what one believe to be realistic. Foote et al. (2012) further argues that the way architects view material can therefore be a construct of cultural values, rather than viewing the material for the qualities and potential it actually has. This perception can however be shifted when hearing new narratives and getting a new understanding of these realities, which then can impact sensitive definitions about different materials.

Dalberg Advisors (2021) argues that plastic plays a very important role in our society today and is one of the most common materials in everyday life. Because of its unique characteristics and the ability to turn into any form and shape, it has found its purpose in many different products and areas of use. It can be seen in any industry and product, from construction, clothing, medical, to the transportation industry. It is today difficult to live without the presence of plastics. It has its highly beneficial properties of being lightweight, durable, strong, affordable, waterproof, insolvent, non-reactive and a resilient material. This makes it suitable for so many applications. Plastic packaging doesn't only ensure food security and safety, it also minimises transportation energy consumption and costs, because of the cheap production and its strength-to-weight ratio. Not to mention how material served a crucial role in the COVID-19 preventing the spread of the pandemic. With the help of medical protective equipment such as facemasks, single-use gloves and aprons, it was possible to save many lives.

Dalberg Advisors (2021) continues to state that the reasons why plastic is such an important and popular material, is also what makes it harmful. As a result of its popularity, during the previous two decades, plastic consumption has nearly doubled. Plastic pollution is one of today's most significant environmental challenges, and its manufacturing, usage, and disposal have a number of negative consequences for society. Chemical pollutants and greenhouse gases are released during the manufacturing of plastic, which can have negative health consequences in humans and contribute to climate change. Given that much of the plastic produced is intended to be used just once, increased plastic production will eventually lead to increased plastic waste.

This garbage is either disposed of through methods that emit chemical pollutants and contribute to climate change, or it escapes into the environment, resulting in plastic pollution. Waste management systems are insufficient to cope with such a high volume of plastic garbage, an average of 41% of plastic waste is mishandled and about 47% of this mismanaged trash escapes into nature and becomes plastic pollution, which commonly ends up in the ocean. Ocean pollution threatens marine life, having a negative effect on ecosystem services and affecting major economic sectors like fishing and tourism.

According to British Plastics Federation (n.d.), with its many benefits, plastic applications within the construction keep on increasing, replacing more and more materials. After plastic packaging, the construction industry is the second largest user of plastics. ODI et al. (2020) continues stating that plastic is seen for its many benefits of being durable and cheap. However, most of the applications in buildings are those that are not visible, in piping, insulation and seals etc. Even though it is this great material, being long lived, resilient, easy to use and affordable, it still don't seem to be considered good enough to use in more noticeable places, almost hiding it where it is not being seen. Because of how the construction industry use the plastic, treating it as almost invisible, people tend to overlook the environmental impacts of the plastic used. Their "invisibility" restricts their environmental impact for end users, and their carbon footprint is often overshadowed by cement and steel, even among more climate conscious construction firms. So unless we as architects start to change the attitude of the material, there will unlikely be any large-scale initiatives making the material attractive for its potential characteristics.

Plastic is usually perceived as a hygienic material, where it easily can be replaced and disposed when used according to McKay et al. (2020). This has been even more witnessed during the pandemic when disposable face masks and other protection gear has been produced to limit spread. The glorified material has many of these benefits when new, many for which it has replaced many other materials. However the plastics life length is usually very short. Today 40% of plastics are used for single use, mostly for packaging. This also relates plastics to the connotation of being almost invisible. A material that does not really exist and doesn't have any value after serving its purpose.

For us architects, the most common method of evaluating different materials is usually from manufacturers' own information or looking at research done for different materials and comparing for and against. In the scientific forum, plastic is mostly discussed in terms of statistics and numbers. LCAs (Life cycle assessments) are common tools to calculate the impact a plastic product has on earth, or the energy it consumes throughout all the different stages of its life. These forums, whether they are more public, scientific or artistic, are often more targeted at educating people on the topic of plastic. The purpose of trying out a new method of storytelling looking at material dignity is not to further educate, but to instead challenge architects ways of thinking and open up to new ideals in order to broaden our way of understanding.

Woolfe (2021) argues that storytelling is however not a newly explored method. It can be considered one of the fundamentals of us as human beings. Storytelling perhaps developed to bound us together as the humans. Creating a shared history and way of viewing life can serve to strengthen our identity as a specie, which can lead to increased solidarity, resource sharing, and other types of cooperation. Storytelling aids in the development of social cooperation and the teaching of social norms. The juxtaposition of stories and human reality provides a profound insight into a common human experience, not just a creative imagination exercise. The internet allows us to consume and share stories with extraordinary ease in our digital age, making it easier than ever before. There are various stories being told about both plastic and about plastic bottles, however, storytelling is rarely used within the construction industry, and especially not when discussing material dignity, which is why the purpose of this thesis is to explore this long existing, but highly forgotten method, and seeing if that can contribute to a better understanding of the many layers of material dignity.

Footo et al. (2012) argues that writing a story about plastic can therefore make us architects see the material as more symbolic, abstract, but also more real. It can highlight the larger societal problems that otherwise might be concealed. We can then start to see that plastic waste is grounded in a larger societal problem of consumption and production and to discover that the things we take for granted might not be "the truth". The act of narrating can therefore be considered a highly effective transformative power, to make us question what good and bad choices are, and to think about cause and effect. This makes us question things we otherwise just accept.

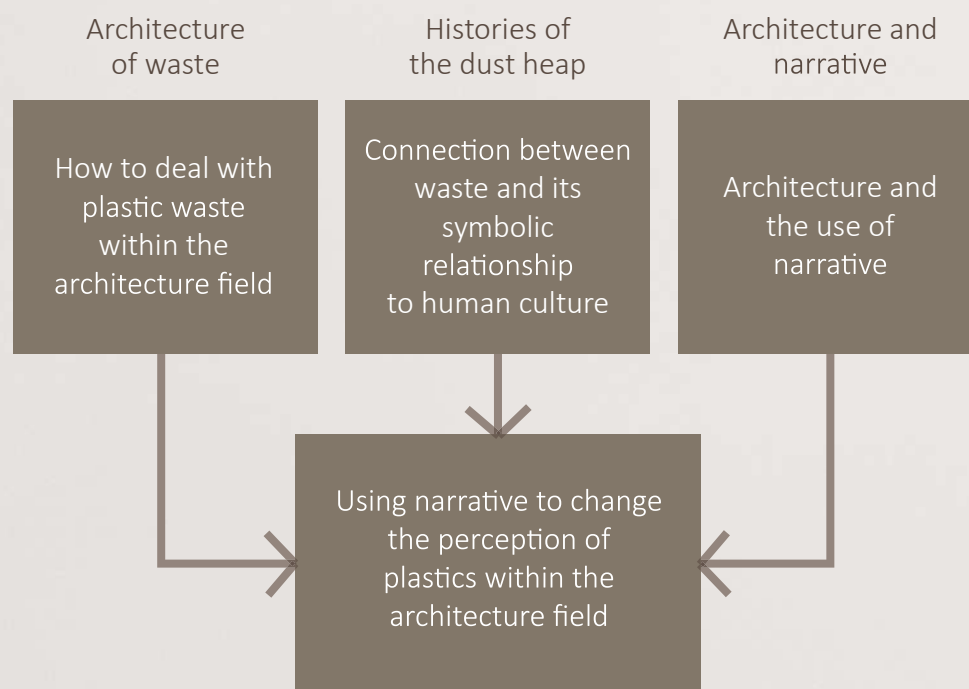
Theoretical Framework

A longstanding issue within the architectural field is that it seems like a large majority of architects have an attitude towards the plastic material as being unappealing, “cheap” and not quite as worthy as other materials, such as wood, glass or steel. Because of this, there are limited efforts in trying to incorporate it more and finding solutions for minimising virgin plastics and reusing plastic waste. There will unlikely be any large-scale initiatives until it becomes economically beneficial and attractive on the market.

To address this, as architects, we need to challenge the status quo and the way we perceive plastics. These suggestions are being highlighted in the books “Architecture of Waste” by Caroline O’Donnell and Dillon Pranger (2020), “Histories of the Dust Heap” by Elizabeth Mazzolini and Stephanie Foote (2012) and “Architecture and Narrative” by Sophia Psarra (2009).

These three books have three different approaches and theories, however they together make up for this thesis’s theoretical framework, in which I try to answer the research question. On their own they serve to better understand the perception of plastic, but collectively they help to navigate the path in which this thesis will take, on how to change the way we perceive the material within the field of architecture.

Figure 1. Theoretical framework diagram



If someone can push this paradigm shift in education and practice, it is us - architects and designers. We are the ones that need to address the issues of architectural quality and resource awareness. This is what O’Donnell and Pranger (2020) highlights in their book. The book states that the effect of a lack of participation and education when it comes down to plastic recycling, competition with virgin plastics and the economical value of plastic waste. O’donnell and Pranger propose that we should use less, reuse what we use, and to remember that recycling (even when circular) should be the very last alternative. This indicates a direction this thesis will take, using storytelling, about providing methods and encouraging better ways of educating architects.

In research from Foote et al. (2012) they take interest in garbage, and focus on the relationship between its material incarnation and symbolic iterations. Doing so mediates different layers of social, political, economical and individual experiences and values. Garbage waste has the power to both materially embody and metaphorically portray complicated ideas of environmental politics and human culture. Garbage conveys contradictory narratives as well as demonstrates how people tell themselves stories about what things seem to matter.

Narratives are nothing more than a representation of time and space. In the book written by Psarra (2009), she digs deeper into narrative, and the relationship it has to our cultural identities and the understanding of our surroundings. If a group of people, a community, believes a certain story to be true, realistic and reliable this is what then becomes their cultural identity. These stories are however just representations of different values and a recollection of information. The act of changing the narrative is therefore an act of changing the preconceived notion of what is believed to be the truth.

Method

Gathering and analysing data could be done in a various different methods, and going for this method of using storytelling is maybe somewhat unconventional, but still serves an important aspects of trying to look at data in a different way then usually done. Doing this promotes presenting and gathering data in a more fun and explorative fashion, which can serve the researcher and architect, by discovering things they wouldn't normally do.

Research Design

Storytelling is based on a discovery method approach, which is a deductive research approach set to learn new facts and build knowledge that will then constantly be analysed and interpreted. It emphasises on the new things that are discovered from facts and data during the process, rather than just finding correct answers and statistics. To unveil preconceived realities, uncover new truths and correlations. This is a qualitative research method, based on secondary data that is being analysed. This data is gathered from literature and reflection and is a way of conceptualising, synthesising, analysing different beliefs, realities, truths and actions.

Through the use of storytelling and facilitating research on the perception of plastic, using narrative, it is possible to analyse and present material in a more familiar, informative and relevant way. Because of its complexity, not being just data, but trying to uncover how that data relates to our cultural identities and preconceived notions, it has to be broken down and presented in such a simple and easily understandable way as possible. Which is something storytelling has the possibility to do.

Storytelling strategy

The storytelling method is based on "Storytelling as a Qualitative Method for IS Research: Heralding the Heroic and Echoing the Mythic." (Kendall & Kendall, 2012) which gives a good insight on how to approach storytelling as a research method.

First of all, storytelling can be written in different functional contexts. This story will be written from a more explanatory context, where it is possible to navigate the different "truths" of materials, and write it more as a revealing, explaining and analysing piece. Doing this allows for one's own interpretations and discoveries. This is vital, since it is supposed to act like a tool for questioning one's own beliefs, decisions and actions regarding a material.

In order to present and analyse accurate data in the way of storytelling, every chapter of the story will be combined with factual statements and statistics. These facts will be found on the side of every spread, to make sure that the story is based on true statistics and reasoning, that only further questions our own beliefs and actions because of the credible details.

Plastic

The research strategy is based on the material plastic. To do so, a common plastic product such as a single-use, non-biodegradable, recyclable plastic PET (polyethylene terephthalate) bottle, that probably all people are familiar with, will be presented as the main character. It is set out to follow the bottle on its journey, from production to landfill and go through some of the most common steps plastic goes through in their life cycle.

By bringing the bottle to life and accessing its inner monologue, it is possible to get an emotional attachment to the bottle, closing that distance between ourselves and the object. It is also presenting a full life cycle of the bottle, giving oneself the opportunity to assess ones own understandings of all stages of the life cycle, from production to afterlife of these products. Which ultimately is set out to challenge ones own assumptions and preconceived notions.

The bottle is chosen because of the familiarity of the object. It is a normal day-to-day object that everyone has some type of relationship to. This makes it easier to relate to it. It is also one of the most common plastic products, and while it is recyclable it is a perfect example of a product that even so, doesn't always end up in the recycling bins or stations. It is one of those objects that can be found in even the most remote places on earth, being washed up from the ocean. Thus the relationship to the architect is its common, daily and societal perception of plastic, which makes them consider their own cultural beliefs.

Storyline

In order to try this storytelling method out, it is built to mimic basic story elements that highlights (Kendall & Kendall, 2012) , which are all common elements found in complex stories. This is done in relation to a quite typical life cycle of a plastic PET bottle. The table below shows elements that should be included, and how these relate to the bottles life cycle. These elements provide data of both positive and negative aspects of the material, the way it is constructed, forcing the storyteller to objectively look at the material from different perspectives.

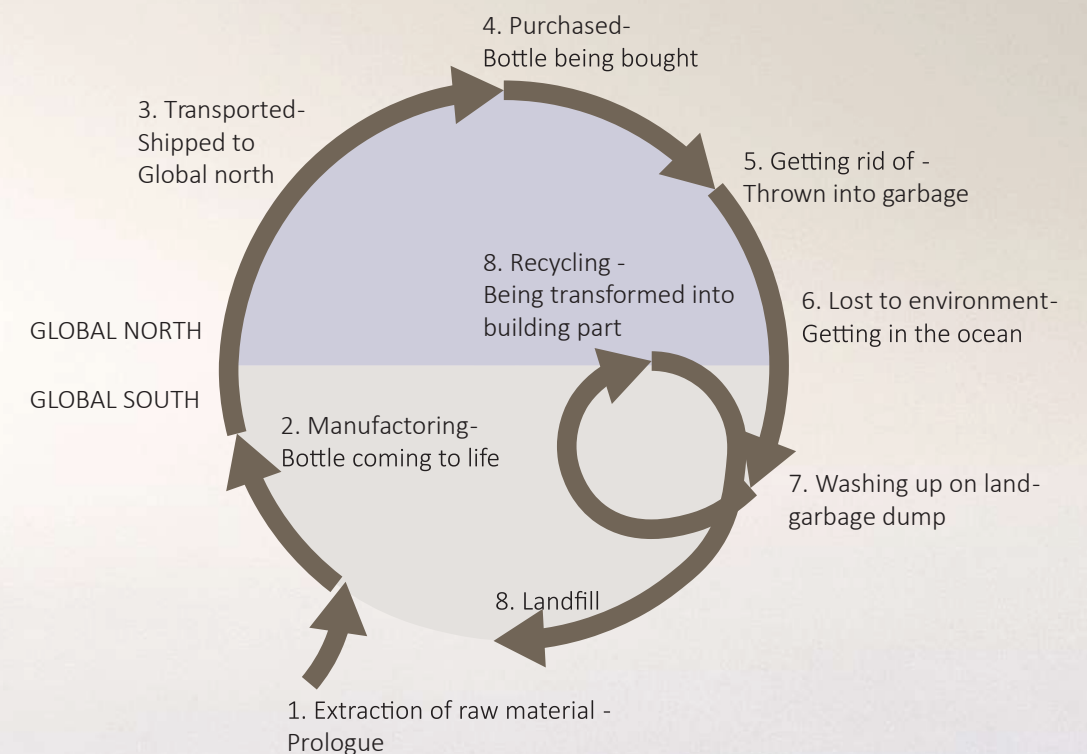
Table 1. Story elements table (Kendall & Kendall, 2012)

Story Element	Storyline	The life cycle of plastic bottle
Mythical Quality	Plastic possesses a lot of potential	1. Extraction of materials
Call to adventure	Plastic bottle is produced and is going to serve its human	2. Manufacturing 3. Shipped
The hero	Plastic bottle	
The goal is revealed	Bottle looking to find its purpose, being bought by a human	4. Purchased- Serving its purpose
Hero's inner problem surfaces	The bottle's purpose is shortlasted and starts questioning its fate.	5. Thrown into garbage
A new situation arises	The bottle then ends up in the ocean, not knowing what to do	6. Lost in environment
The hero is tested	Dealing with loneliness, lack of purpose, feelings of inadequacy are surfacing. Treated invisible	
Enemies or forces of nature intervene	Humans keep discarding the bottle, making sure it is not visible for them to see	Human once again discards the bottle
Hero encounters new obstacle	Ending up in garbage dump	7. Ends up in garbage dump
Hero experiences a transformation	Bottle is being recycled	8. Recycling bottle
Hero experiences a setback	The recycling ends up ruining any future possibilities of being recycled again for the bottle	
Hero may be deceived	Questions human's decision making	
The situation is resolved	Still gets to have a purpose of being a part of a building	
Lessons are learned	Questioning its own existence, whether it was right for it to be produced or not	9. Ends up in landfill

The storyline was combined with a quite common, made up life cycle of a plastic bottle, which is represented in the diagram below, showing the journey the bottle will take. So in addition to the story elements contribution to making up the story, it was also based on common journey's plastic products may take in their life cycle, from cradle to grave.

This diagram will then guide the reader while reading, showing this diagram on each chapter of the story. It is also an indicator where in the world these things are happening, to highlight the difference between the global north and global south, to show how the impact ones own actions has on not just one part of the world, but how it affects everyone else as well.

Figure 2. Storyline diagram



Data analysis methods

In favour of seeing if storytelling is a good alternative method for analysing data and challenging your perception on materials, this thesis will conduct a comparative study of my own perception of plastics before writing the story, and then to see how it has changed after the process. This will then determine if it is possible to change one's perception of a material such as plastic, and if it will contribute to a greater understanding of the material and how it can be used in a more efficient, dignified way.

The story is built up in such a way that it forces the writer to look into both positive and negative aspects of the materials, and that it from a theoretical aspect then contributes to a greater understanding of the data's correlations and viewing it from otherwise overlooked perspectives, as well as the story is contributing to a more emotional perspective of the material.

The data that this story is built upon is based on knowledge from various sources, in order to get as broad of an understanding of the subject of the material as possible. Since this is a discovery method approach and requires a bigger understanding of the material, it is important to not look at only one input of information, but rather looking at all types of sources. Everything from scientific reports, books, to pamphlets, shops selling the materials products and environmentalist websites. All to get a wider understanding and find correlations between the facts.



RESULTS



My perception- After the process

From going through this method of discovery, of using storytelling to uncover new perceptions of plastic as a material I learned a great deal of new facts and perspectives. It helped me uncover many new layers of the material and ultimately changed my perception of the material.

Going into this process I had quite a negative view of the material, wishing it to be banned altogether essentially. I however saw its great benefits, knowing how it saves food and how it has helped us save lives during the COVID-19 pandemic, but didn't know how to tackle these issues without banning the material and forcing new biodegradable innovative materials to replace it.

I now have a much more positive attitude toward the material as a result of this process. I can see how important it is in so many situations. How it has fueled globalisation, allowing goods to be transported in a much more energy-efficient manner, reducing transportation volume, to name a few examples. Without it, the construction industry would be much more expensive and energy-intensive, and workers would be forced to carry much heavier loads if the wrapping was made of a material other than plastics. Despite the fact that there are other potential candidates, such as paper for certain applications such as transporting building parts.

This has helped me understand the complexities of the plastics problem. It is a fantastic material for so many reasons, but it is not a sustainable material to use unless we have the infrastructure to deal with waste management and post-use care. I've also gained a better understanding of the importance of only using plastic when absolutely necessary. There are numerous products and applications that could be made of different materials, but many choose plastic because it is less expensive than other materials for example, which affects the material's dignity and our perception of it as a lower valued material than it is.

Recycling, which is considered a good option for treating plastics after serving its purpose, is not as green of an option as we think. Plastic, unlike other materials, cannot be recycled, but will only downcycle since it loses its quality in the process no matter what, and can only be done just a few times. Downcycle provides a better option than the plastic ending up in landfill, however it only ruins the plastics capabilities, and making sure that it will end up in landfill eventually. That's why we as architects should think about the plastics' whole life cycle, and not only consider the many years that the plastics will be used in a building. It should be considered how to deal with it afterwards in order to minimise plastic waste.

Reflection

This part discusses the results of the storytelling method and brings up these key aspects:

- The perception changed using the storytelling method.
- The method was good because of its potentiality at forcing yourself to look at many different data, both positive and negative. As well as having to see it from another view; humanising the material made you see it from another, more emotional perspective.
- Storytelling however has its downsides, where biases still can play in.
- Time consumption and the complexity of the storytelling is questioning the method.
- Storytelling as an approach for the future.
- Material dignity can be achieved if we recognise the value of the material.

According to the theory presented in this thesis, changing the narrative of the realities and representations presented to the individual in our society is necessary to influence one's way of thinking and perceiving a material like plastic. Where the narrative represents a person's cultural identity. That, in the end, when architects understand both the symbolic power of plastics representation in society, as well as its materiality, it becomes possible to think differently about the material: not just about recycling more or banning the material, but about using it for its benefits, while also limiting the negative impacts of the material. This can help to cultivate the symbolic and affective work that plastics perform, demonstrating the material's possibly real version.

This thesis was created to investigate a new alternative method for architects to analyse and explore data in order to make more conscious, impactful design decisions, as well as to see if changing one's perception could help with this. It is clear that the method of using storytelling to challenge one's perception of plastics worked, as evidenced by how the perception changed throughout the process. There is now a greater understanding of plastic and I hold it in higher regard. I have a newfound respect for the material, and I will definitely think about how I use it in the future as an architect.

Benefits of using storytelling

As a result, this thesis concludes that the research method was appropriate and beneficial for exploring these topics in a unique but beneficial manner. By using storytelling, it was possible to make a very complex and layered problem more representational and concrete, despite the fact that it was presented in a more abstract way. Finally,

the method was a more enjoyable and less formal way of presenting data in order to uncover information that would otherwise be difficult to find. The story elements guided the plot and data collection to cover both positive and negative aspects of the material, ultimately leading to lessons and thoughts about its existence. This was necessary in order to gain a better understanding of one's perception and knowledge of the subject. Even though not all aspects or data could be presented, it forced the research to view it from angles that probably normally wouldn't be considered. The way it was written from the perspective of the plastic bottle also encouraged more empathy for the bottle and more emotionally attached to it. This method of analysing the data and converting it into how the bottle would feel was crucial in understanding all of the implications of our way of viewing the material and how our society as a whole treats plastic. This was one of the advantages of using storytelling as a method, as well as one of the key components that made it work so well.

Limitations

However, it is impossible to show every aspect of the material and uncover all layers in a story, even if it aids in furthering the understanding of the subject and digging much deeper than you would normally. When writing a story, some of your biases will always come into play, influencing the story's results and, in turn, the story's outcome. It most likely did the same thing in this story. Still, how the story ends and the references used have no bearing on whether the results will be good or not, because they will all help build a new narrative out of the data gathered from various sources. To see if we as architects can uncover new layers and force us to see new perspectives, which could lead to the discovery of new truths and perceptions.

The thesis discovered throughout the process that the amount of time and steps required to use this data-driven story was inefficient. This time consuming process started questioning whether or not it could be used by architects on their own. It's difficult to imagine how we'd use it or what application it would have. Even though it proved to be effective at assessing data in new ways and changing one's perception of the material, it may not be the best method for architects. It is questionable how much time they would be able to spend on such a thing. Instead there's a possibility of using it for researching within academia. Here the application of the storytelling would be much more sufficient, and could possibly be a really good tool for assessing data. These stories created can also be used for educational purposes in the future for others, so that people does not have write their own stories.

Ahead

For future adaptation, a model for architects could be developed that serves the same purpose as storytelling but is much easier and faster to use to achieve the same results. The findings revealed that in order to achieve material dignity, we as architects must first become more aware of ourselves and our surroundings, challenging our thinking and understanding our biases and cultural identities. We can't begin to see different aspects of the material and the consequences of our decisions until we've done so. When we are aware of the consequences, we can make more informed decisions. A model of these steps could be created and used by architects in the future, before entering their initial design process.

The most important lesson learned about ensuring material dignity and what to bring is to question our own professional assumptions about why and how we use the materials we do. Recognise that we determine its value, and that it is our responsibility as designers to make decisions that maintain material dignity. If we as architects have the ability to change people's perceptions of a material by portraying it in a more positive light that ensures positive effects on future use and the environment, our value and perception will eventually be echoed by the general public, resulting in a positive spiral of the material's dignity.

Contribution

The contribution this thesis makes, is to be more open up about the options you have when viewing data. Even if storytelling might not sound like the most appealing or interesting option, it is important to consider that there are various ways of gathering data, and how to analyse it and that it doesn't have to be formal and boring, but can be done in more unconventional methods that are way more fun.

It has also contributed to the understanding that there is a difference between perception and reality and in order to connect these two, we might have to question our own preconceived notions- And as architects it is vital to challenge our way of thinking, since we in our buildings are portraying narratives already about cultural messages, so to have an open mind, can create more conscious and impactful designs, using material for the dignity that it deserves.

Conclusion

As architects, we face an ocean of design choices, weighing a plethora of factors and also navigating a relatively new, but increasingly important aspect of sustainable thinking in the construction industry. We are often guided by what we already know and feel safe with, rather than constantly exploring new uncharted territory. When it comes to material choices, the goal of this thesis was to see if it possible to make that process easier, making sure we understand materials' positives and use them to their best abilities, and at the same time try to limit the negative aspects of the material.

According to the theory presented in this thesis, we must question our perceptions of materials in order to be able to reach material dignity. We must comprehend its deeper symbolic impact on society, as well as the fact that our perception of it is linked to our own cultural identity. To change our perception of the material, we as architects must first question our own perceptions of ourselves and the world around us. Change the narrative that governs our perceptions of what we believe to be true and realistic. Plastic was used as a case study throughout the thesis to better understand material dignity and how it is perceived. Plastic serves a useful purpose in understanding its perception as a material that is both useful and important, but also pollutes and destroys wildlife and oceans.

To do so, a storytelling method was developed to explore if it would be a good method for ensuring material dignity or not. A single-use plastic bottle was used in the storytelling, to look at plastics from a different perspective than we are used to viewing and analysing data. It was set in a westernised cultural context, with the bottle embarking on a journey that is typical of bottles purchased and used in western society. This allowed for recognition of our own identity and culture and reflected on the narratives in which we live.

When it came to challenging our professional perceptions of plastic, the method of using storytelling proved to be effective. The process of writing the story made it easier to see both the advantages and disadvantages of using plastic, as well as the correlations to how and why we treat it the way we do. However, it was questioned whether this would be a good method for architects to use in the future when deciding how to give a material dignity. Storytelling as a method requires an investment of time and energy into practice, performance, and cognitive processing, something which architects in the profession may not be able to invest in. There may however be beneficial applications of this method in academia for research purposes.

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