[Section 330] [Smart City Trash Waste] [gogreenfuture!]

Home Contemplative Practice, In-class activities, and Homework - Team and Project Overview -

Assignment 7: Individual Research Prospectus ~ Home

Include your Digital Storytelling work at the top of the page. Many of you have already been experimenting with this idea of how to bring images, audio, video into a narrative framework through your City Sensing work. You should use those experiences and material as a good first step in thinking about how to do digital storytelling. People narrated over a video trail walk, narrated over images, and told really beautiful stories that placed themselves, humans and material together. We are asking that you repeat this, but focus on aspects of the topics you have chosen. Tell a human, emotional story.

You can find resources here:

https://digitalstorytelling.coe.uh.edu/page.cfm?id=22&cid=22)

If you want to see stories without the media richness, but beautifully told narratives here are some from our own community: https://news.virginia.edu/content/double-take-take-two

If you want a depiction of how to integrate a narrative over digital media to help evoke an emotional response coupled to narrator insights (not solving) check out this item that was shared from the IX sensing (thanks Sean): https://youtu.be/ESyJop31cmY

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NOTES:

view the problem on a global scale:

1. what policy of waste processing is being used? how should we design a localized policy? linkage between global and local

- net problem of global waste: overproduction of plastic? overuse of plastic? ...
- 2. how to make people aware that there are problems in processing waste
- 3. Charlottesville only export its waste to surrounding area but not deal with waste by itself
- 4. only #1 and #2 kinds of plastic are recyclable

5. are we going to make individuals more attentive on waste problems(retail, education) or on a city scale?

Feel free to use this interchangeably with the background literature and review section

Where does Charlottesville Waste go?

1. McIntire Recycling Center, RSWA Ivy Material Utilization Center, RSWA Paper Sort Facility for general recycling (Separation is the responsibility of the citizen)

- 2. No Charlottesville Recycling center dedicated to plastics, regional stores accept them
- 3. Hazardous waste disposal is mostly delegated to regional chains and not municipal facilities.
- 4. In some areas recycling services are free.
- 5. Items not accepted can be brought to the Rivanna Solid Waste Facility.

What is the most common waste type?

- Organic Waste (Causes Methane -> affects the globe)
- How do we figure out the correct numbers?
- What is the waste profile??
- How it is treated? Are proper waste types treated correctly? What causes mistreated waste?

1. Contamination is avoided by separating different recyclables from each other and avoiding single stream whenever possible.

What are the known problems?

1. Currently there are no unacceptable risks to human health or the environment around the university

- What current policies and infrastructure in place?
- Charlottesville waste companies and territories?
- Bin Types?
- A monopoly? San Francisco
- Incentives & Disincentives

How is the rest of the world deal with waste? Currently it is in a state of transition.

Vision

The current waste management system/cycle is outdated and desperate for innovation. The general public doesn't know what is recycling or how to recycle, where does our trash ends up at and what happens with it. After China has refused to take in plastic waste from the US, we need to reevaluate responsibilities as individuals to do waste management better. We should not recreate the broken system of waste management but innovate a creative, more effective management. This requires reeducating of public, building circular economy and treating waste as resources. We will be focusing mainly on smart waste practices and focusing on changing these processes for the better of our environment. This will require us to research both the global and local systems of waste management and deducing it down to the scale of Charlottesville.



Background and Literature Review

This section will summarize, analyze, and explicate several items related to the research questions, topic, and value proposition. Items that will prove invaluable are:

- General background details of any stakeholders, partners, groups, historical context, or cultural traditions that you deem relevant. You might find it useful to diagram this with a figure.
- The published literature you have found which help document what we currently about the topic (which might be contradictory or ill defined) and what scholarship exists that helped refine your research questions or research strategy (think concepts and methods). *This will help you in the group project and in the creation of your individual research portfolio.*
- You should relate this information back to the research questions. In other words, your research questions have some sort of frame of reference and justification that can be understood as part of an ongoing question of how the world operates and existing case studies that help you understand your own case studies.

Through some research, we were able to find a couple of local partners:

- Teri Strother Kent, Charlottesville Climate Collaborative
- Kristel Riddervold, Environmental Sustainability Manager at City of Charlottesville
- James H. Lambert, Professor at UVA Engineering Systems and Environment

There also has been a couple of articles on The Cavalier Daily [1] on how the Facilites Management at UVA is taking extra steps on keeping recycling waste clean. The author of this article, *Lucie Rutherford*, would be a great contact to take her research forward. This article is a good starting point that talks about UVA's waste management process. We will need to contact the partners listed above as well as find new partners to elaborate our investigation.

How is China recycling waste?

- Recycle technology for waste PCBs in China is still immature.
- Total production value of the PCBs manufacturing industry has already reached more than \$10.83 billion in 2005
- 50–80% of the collected domestic WEEE is not recycled domestically but rather shipped to destinations such as China [11].

In our investigation to improve the waste management system we feel it is necessary to look not only at the current practices both locally and globally of waste disposal, but also to focus on how consumers play a key role in the waste management system. The role that we believe consumers play is that they can reduce the production of waste by purchasing goods that don't simply become waste products. This idea itself helps in the prevention of waste. The article *Policy Regimes for the International Waste Trade* [8], explained the important role of the consumer on waste disposal by noting that companies had to adapt practices order to adhere to a growing demand and environmental consciousness by consumers. This shows that consumers have a hand in driving disposal practices with voting through the purchases that they make. Another ideology that both reinforces the importance of the consumers while also incorporating the global impact of waste disposal that can be found in the same article was the not-in-my-backyard (NIMBY) syndrome. The NIMBY syndrome led the system of exporting waste in essence to not have to deal with the waste or have it in close proximity. The article Recycling, recovering, and producing "food waste" [9] also emphasized considering the consumer behavior and/or consumption pattern as oppose to the efficiency of production by companies also help in prevention of creating waste. Since we saw such an importance lies with the consumer we found it necessary to ask how could we encourage consumers to consume in a more environmentally friendly manner? This question is important for being able to not just identify the problems associated with consumers, but also to act to reduce waste production. This approach to study consumer behavior is investigated in greater detail in the article Consumer Behavior Concerning Post-Consumer Waste [10], where it gives an example of food going to waste simply because someone bought more of something than they needed due to a product being in sale. The article also goes into detail in ways a consumer can buy smarter by suggesting a set of questions a consumer can ask themselves about a product.

Research Questions and Division of Labor

Each of the team members will be responsible for creating, and being responsible, for a research question related to the overall project. Each question will derive from the individual team member and be negotiated within the team as essential to the blueprint. Your original research question might need to be modified or your research question might require the team to modify their vision slightly. This is a negotiation amongst the group; you should advocate for what you believe to be important even if the team doesn't initially understand the value.

VERY IMPORTANT: a research question should evolve from the international perspectives we have included in the course: "How have people in other areas of the world thought about, built, reconfigured, fought against, supported, or innovated in ways that could inform this blueprint."

Think of this as a roadmap for the rest of the blueprint.

1. Mert - Waste profile in Charlottesville

According to the 2016 TJSWPU Solid Waste Management Plan [11]; in Charlottesville/Albermarle County generates 125,798 tons of municipal solid household waste. On the other hand, the number of primary recyclable materials is 75,533 tons. This includes statistics from materials like paper, metal, plastic, glass, textiles, tires, oils and etc. It is very important to know what kind of materials are present in the system in order to come up with a waste management plan. We can use these statistics provided by the TJSWPU to analyze and understand the waste profile in Charlottesville. We will be focusing more on the recyclable materials and how are they being processed.

2. Johann - What is our waste connection with China and what are we doing currently? This question addresses the questions of where does waste goes and how is it treated. Why was waste exported in the first place, why was that policy reversed, and what are the implications of that in Charlottesville and other regions. ADD TO BACKGROUND: Cargo ships transported goods to the US and brought back recyclables. In 2018 the National Sword policy ended China's import of plastic recyclables. China has a host of environmental problems of its own making, and it sought to reduce the load on its own waste processing facilities. Furthermore, contamination rates had made most of the plastic unusable. Globally more recyclables are ending up in incinerators or landfills. This ban could have an upside. This trend has only existed for a quarter-century, and during this period only 9 percent of discarded plastics were recycled. China also has the highest rates of mismanaged waste. New methods and centers could be developed locally. Incinerators could be used locally. Chinese developers who have been displaced are also relocating to America. Current policies: Recent developments have caused rates for recycling services to increase. Residents opted not to sign up for continuing recycling services. Single Stream increased convenience, but the waste was mismanaged in China and ended up in the Ocean. Albemarle began accepting only resin codes 1 and 2; meaning a greater amount of plastics and their associated toxins will end up in our landfills and eventually into the air, earth and water. Resin Codes 1,2,4 are usually recyclable.

3. Leyao - China as a country had been taking and processing waste from other countries for almost 20 years. Each year, more than 2/3 of total of paper waste from the US and more than 2/3 of total plastic waste from the UK were transported to China. How was such waste being processed in China? What benefits for these cities/countries to process waste are and why China is now refusing to take waste from other countries?

4.Bowen - Compare between monopoly and distributed waste management RecycleLA program is an example of monopoly waste management. The groups argued that by creating little trash monopolies, the city could set more aggressive requirements, including stricter recycling targets and higher wage mandates. However, the price of waste disposal for residents is skyrocketing over these years. Since the monopoly and distributed waste management can have such significant influences on residents' life, we feel responsible to figure out the advantages and disadvantages of these two systems.

5.Alyssa - How to encourage consumers to choose companies and policies that are designed to be environmental friendly?

Stakeholder Diagram and Analysis

This would be best depicted through a diagram, such as the SCOT style of depicting the relevant social groups, problems, and artifacts. You should then augment the diagram by explain how we arrived at our current situation and who is currently present who might inform us of how to alter the current situation. For example, who is attempting to define a problem, redefine a problem, what current interpretive flexibility exists among the relevant stakeholders, and what current and proposed technological systems or policies or actions are being discussed.

Stake Holders:
Municipal government:
Goals:
1):
2):
Manufacturing Companies/Factories
Goals:
1) Recoverable Plastic - Solution: push for sorting recyclables or cut down on supply
2) Cheap services and products
The Public/Citizens in Charlottesville

Goals: 1) Convenience - Solution: Single Stream Plastic 2) Green policies - Solution: Widespread adoption of recycling services

Chinese facilities
Goals:
1) Recoverable Plastic
2) Limit harm to international image
3) Deal with own environmental problems

Notes:



Value Mapping and Hierarchies

This will be a map of the values that are embedded within your vision. You will be documenting the origin of the values, where you learned about alternative values, and what values can't be represented by your blueprint. This space will likely be both visual and text-based depictions. You will encounter a Smart City Wheel early as one depiction of how to find values in design. There are many other ways of depicting values, e.g.: geographically, organizationally, through community association, historically, demographically, or linked by human or non-human actors.

You should find your own way of expressing the values mapping.

You will need to include the hierarchical diagram from our Value Sensitive Design Discussions that includes values, norms, and design specifications (see <u>previous in-class conversations</u> and more <u>in-depth VSD</u> <u>presentation</u>); <u>you've seen material from this very easy to read document</u>).

Values:

- 1. Stability and sustainability
- 2. Smart Environment
- 3. Civic engagement
- 4. Circular Economy Norms:
- 1. Waste policy should be transparent, communities should be able to engage in or learn about waste policy
- Waste management should not be prohibitively expensive
- 3. Waste facilities should define and enforce standards on mismanagement and containment
- 4. City Planning
- 5. Public Responsibility
- Design Specifications:
- 1. Recycling rates should not lag behind the state's overall recycling rate of 42.8%
- 2. There should be an accessible central hub of information regarding Charlottesville's waste policy.
- 3. Facilities should be appropriately able to separate recyclables within the context of single stream processing.

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- 4. Rates for recycling services should be reduced, if it all possible, to levels below 2017 rates.
- 5. Trash pickup locations are invisible



[1] Rutherford, Lucie. "Facilities Management Team Aims to Keep on-Grounds Recycling Clean, Useful for Repurposing." *The Cavalier Daily*, 2 Oct. 2019, www.cavalierdaily.com/article/2019/10/facilitiesmanagement-team-aims-to-keep-on-grounds-recycling-clean-useful-for-repurposing.

[2]https://www.latimes.com/opinion/editorials/la-ed-trash-fees-20171002-story.html

[3]Castro, M., & Castro, M. (n.d.). Reduce. Reuse. Repair. Recycle? • Charlottesville Tomorrow. Retrieved from https://www.cvilletomorrow.org/articles/local-recycling-now/.

[4]Cheryl Katz, Cheryl Katz, Cheryl Katz, Katz, C., Katz, C., Leslie, J., ... Hockenos, P. (n.d.). Piling Up: How China's Ban on Importing Waste Has Stalled Global Recycling. Retrieved from

https://e360.yale.edu/features/piling-up-how-chinas-ban-on-importing-waste-has-stalled-globalrecycling.

[5]Hays, E., Hays, E., Woods, C. R., & Woods, C. R. (n.d.). How to Recycle in Albemarle County • Charlottesville Tomorrow. Retrieved from https://www.cvilletomorrow.org/articles/how-to-recycle-in-

albemarle-county/.

[6]National Sword strikes Crozet • Charlottesville Tomorrow. (n.d.). Retrieved from

https://www.cvilletomorrow.org/articles/local-recycling-now/mini-articles/70941.

[7]Share of global mismanaged waste. (n.d.). Retrieved from

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[8]Shin, R. W., & Strohm, L. A. (1993). Policy Regimes for the International Waste Trade. *Review of Policy Research*, *12*(3-4), 226–243. doi: 10.1111/j.1541-1338.1993.tb00562.x

[9]Mourad, M. (2016). Recycling, recovering and preventing "food waste": competing solutions for food systems sustainability in the United States and France. *Journal of Cleaner Production*, *126*, 461–477. doi: 10.1016/j.jclepro.2016.03.084

[10]Jean-Vasile, A. (2016). *Food science, production, and engineering in contemporary economies*. Hershey: Information Science Reference. Retrieved from

http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=B262BE5C2D9247C7D33E90118A7171B5? doi=10.1.1.625.2288&rep=rep1&type=pdf

[11]Wanner, William. 2016. "Thomas Jefferson Planning District." 59.