I. How do we learn to perceive objects in order to glean the information they encode about people?

The Technical Artifact: Into the Blackbox of Human Artifact Creation Data
Course: Design Studio II with Martha Rhettig & Sabrina Dorsainvil

Human Data Project Brief

The *Technical Artifact* was created in response to the following prompt, titled the Human Data Project:

> What does it mean to be human? What kinds of data do we produce? As individuals? As a society? On a daily basis? Over long stretches of time? In a single second?

> How does it get tracked or recorded? Should it be tracked? What happens after it's tracked? When is it used in harmful ways? For good? Who has access to that data and why?

> In this project you will explore the relationship between humans, the data they produce, how it's recorded, represented, tracked, and used. You will create a piece in response to themes of human data.

From this perspective, I focused on exposing a user to the process of problem solving involved in artifact creation, as a medium for teaching empathy and facilitating contact between the user and the humanity of others. In a nutshell, the Human Data project explores:

As you can imagine, the solidification of this goal has come at the end of a long process, but I didn't start here, and I don't intend to end here either. It started with the question:

> *Can you teach someone empathy?*
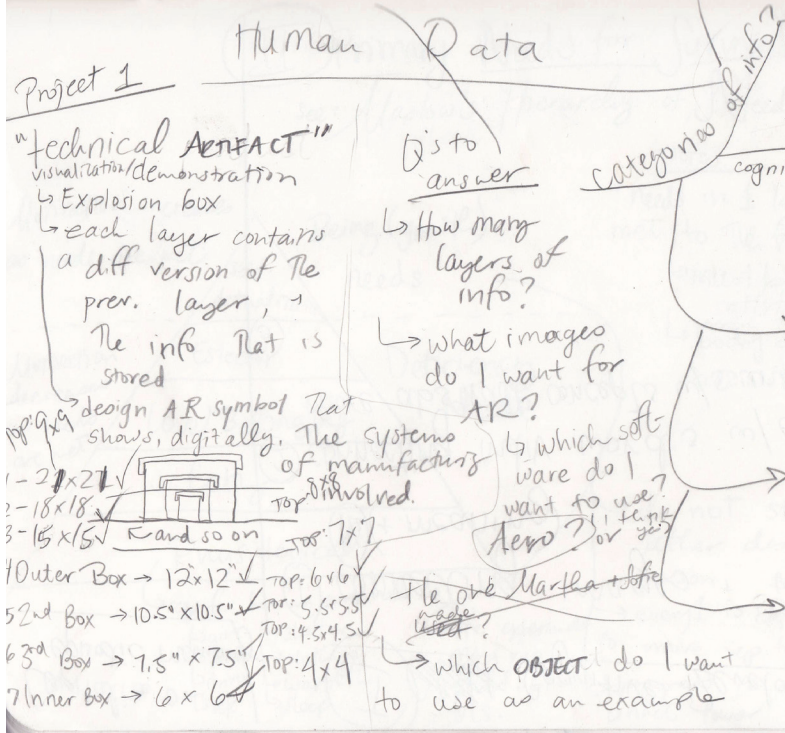
Introduction

Life is a series of discoveries of how the perception of our greater environment changes as our cognition matures. As individuals, these discoveries are often explorations of our complex, intersectional realities, which in turn are highly influenced by our physical and conceptual environment, including our heritage, local biome and culture, language, and current cognitive maturity. Sometimes these explorations seem more like problems or challenges.

Humans create artifacts (both tangible and intangible) as a byproduct of these explorations and embodiment of the discoveries thereon. Is it possible to analyze these artifacts and reverse the process of discovery, in order to glean an understanding of its creator and their original exploration?

When reflecting on our artifact creation history (Fig 1, p. 8 - 15), the most immediate inquiry that follows is to define the specifics of the relationship between people and objects. I start by looking into the elements that make up the artifact creation process. One of the primary elements that catches my attention is the role of problem solving in artifact making; specifically, what types of problems arise and are prioritized, which information is considered when attempting to solve them, and how that information is encoded into the resulting artifact.

With my *Technical Artifact* project, I visualize the process of analyzing an artifact as an invisible information time capsule, a black box, if you will, as an exercise to help the viewer access this hidden information, and change the perspective from which they view inanimate objects in the process.

Designing Design -
Kenya Hara

Design of Everyday Things - Don Norman
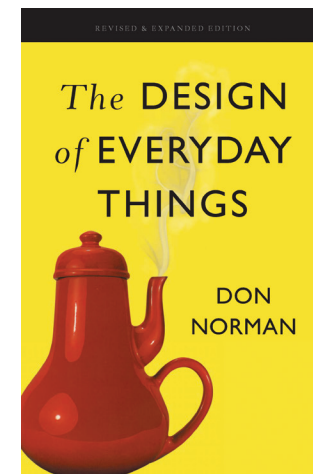
Contextual Research

The Dawn of Everything : A New History of Humanity- David Graeber and David Wengrow
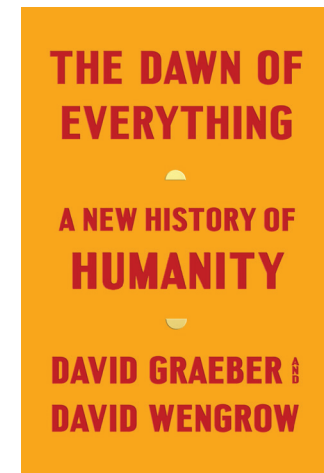
"Faster, Better, Cheaper" in the History of Manufacturing: from the Stone Age to Lean Manufacturing and Beyond - Christopher Roser
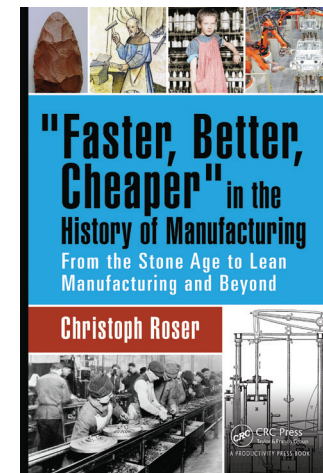
Sapiens : A brief History of Humankind - Yuval Noah Harari
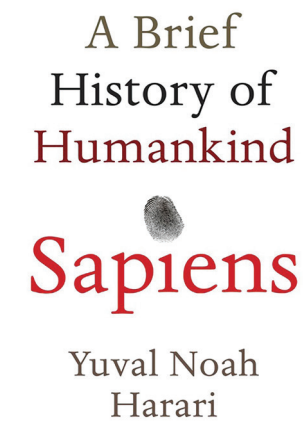
Everything is Someone - Joshua Noble & Simone Rebaudengo

Absolute History Youtube Channel:

"Edwardian Farm"

"Tudor Monastery"

"Wartime Farm"

"Secrets of the Castle"
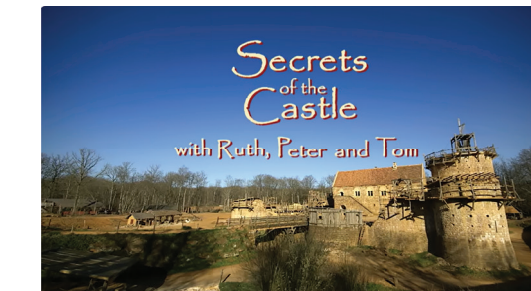
Guns, Germs, and Steel: The Fates of Human Societies - Jared Diamond
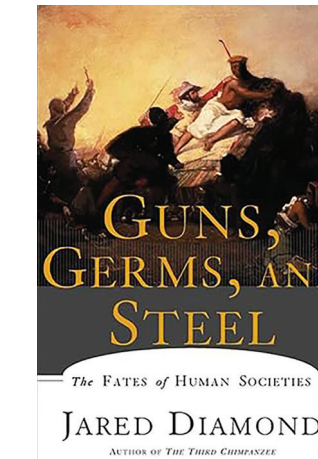
Some Virtues of Design - Gui Bonsieppe

Towards a Philosophy of Photography - Vilém Flusser

Vilém Flusser

TOWARDS A PHILOSOPHY
OF PHOTOGRAPHY
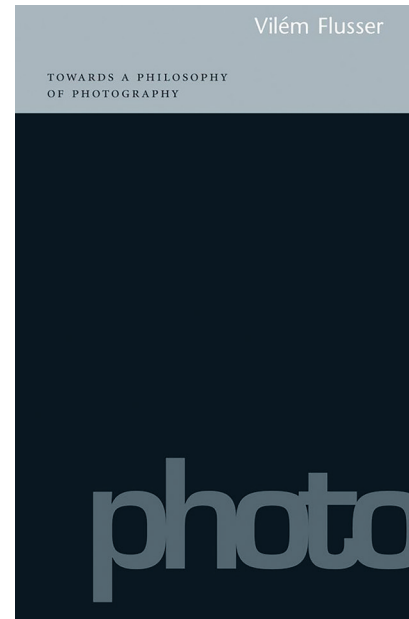
photo

Vilhelm Flusser was a Czech-born Brazilian philosopher, whose best known work is *Towards a Philosophy of Photography*.

The piece deals with the anthropological definition of the terms "(traditional) image," "technical image" and "apparatus," to argue that the invention of the "technical image" (ie: the product of a camera ; a photograph) is a second **fundamental turning point in human history**.

To summarize Flusser's argument in the book:

1. Humans are naturally inclined to identify and interpret (here he uses the terms *imagination* and *scanning*, respectively) *images*, not text

   → Images

   → *"... signify 'something 'out there' in space and time, made comprehensible to us as abstractions (as reductions of the four dimensions of space and time to the two surface dimensions)"*

      → Can be taken in at-a-glance, or read into more deeply (see *scanning*)

   → Imagination

      "specific ability to abstract surfaces out of space and time and to project them back into space and time" (-ation as in the *"denoting an action or an instance of it; denoting*

a result or product of action."); here **morphologically** meaning *"the (process of) creation/production of images"*

→ *"precondition for the production and decoding of images; the ability to encode phenomena into two dimensional* [non-alphabetic/scripted ; more iconographic] *symbols and to read these symbols."*

→ We use a system called scanning (yes, like a printer), where we identify "hot spots" of information in the image, and the more we look at the image, the more details ("less-hot" spots) you are able to glean from the image, repeating this process in an instinctive manner, returning to significant images, and giving them a temporal existence and relationship by looking at one element "before" another, or going "back" to an element "after."

→ *"one's gaze follows a complex path formed, on the one hand, by the structure of the image and, on the other, by the observer's intentions... The significance of the image...* [is] *a synthesis of two intentions: one manifested in the image and the other belonging to the observer... While wandering over the surface of the image, one's gaze takes in one element after another and produces temporal relationships between them. It can return to an element of the image it has already seen, and 'before' can become 'after': The time reconstructed by scanning is an eternal recurrence of the same process."*

→ *"... one's gaze also produces significant relationships between elements of the image. It can return again and again to a specific element of the image and elevate it to the level of a carrier of the image's significance."*

→ *"The space reconstructed by scanning is the space of mutual significance."*

2. text was created to encode those images further, to "*tear up*" these images into linear representations of the information they contain

   to shift the process of imagination and scanning (an arbitrary spatial-temporal intake process) to a linear one, adding a layer of abstraction, and limiting the possibilities of interpretation of the encoded image to the order and manner of description.

   Furthermore, with this abstraction, there is a loss of meaning that would have been available via scanning the image, so with time the meaning and image get lost.

3. The "technical image" initially resulted as a method to re-encode written information to bring back that information, creating a nested series of information that can only be resurfaced

MIT Campus Map

YOU ARE HERE

with intense and informed observation and reconstruction of the text that preceded the technical image, and then original image torn up by/in order to create the text.

   "*Texts admittedly explain images in order to explain them away, but images also illustrate texts in order to make them comprehensible.*"

4. Finally, he argues that technical images are created by an '*apparatus*,' which he defines as a lens (both physical and proverbial, singular and multiple) that stands between the human and the image, affecting how the image is perceived, and which information gets stored and accessible to the viewer.

Some examples are the artist's perspective in creating a painting of a place, carnival mirrors, or, Flusser's focus, the photographic camera.

In seminar class, I created a video (pictured) to give visual interpretative value to this concept, and stored all the information above in the video. What results is a "technical image" of Flusser's writing, that is a linear explanation of the circular and random process that we naturally undergo as humans viewing images, which we use to understand the world

I know, concept-ception.

I. The Technical Artifact

I. The Technical Artifact

^ Lego (& other building block toys)

^ Time Capsules

< Puzzle Boxes

Fractals >

Visual & Content Inspirations

Russian Nesting Dolls

Blackbox (planes)

Conceptual Development

In the first Human Data assignment, we were tasked to define the term for ourselves, provide 3 extant examples of the concept based on our definition, and give project ideas derived from these.

I, of course, did what I always do, and first defined the terms. Merriam Webster defines "human" as:

"(Entry 1 of 2)

1: of, relating to, or *characteristic* of humans

2: consisting of or *involving* humans

3a: having *human* form or *attributes*

3b: representative of or *susceptible* to the sympathies and frailties of human Nature

(Entry 2 of 2)

: a bipedal primate mammal (*Homo sapiens*) : a person : MAN sense 1c —usually plural

broadly : HOMINID "

I pulled terms from this definition, bolded above, to be included in my definition of 'human data,' paying close attention to and including words that also rung with significance to my definition of artifact creation.

Then I searched for the definition of 'data' alone. I again referenced Merriam Webster, which defines 'data' as:

"1: factual *information* (such as measurements or statistics) used as a basis for reasoning, discussion, or calculation

2: information in *digital* form that can be transmitted or processed

3: information *output* by a sensing device or organ that includes both useful and irrelevant or redundant information and *must be processed to be meaningful*"

I also used these definitions and keywords to create a word cloud for the term, included below on the left.

This process led me to define Human Data as follows:

Human Data: Definition

1. Factoids and information regarding humans, in any capacity , which can have value on their own, or processed for easier analysis

2. Information/factoids capable of influencing human beliefs or behaviors

3. Information and information-gathering tools that can be used to determine high-level things about the human experience

Can be qualitative or quantitative, and describe an individual's or the whole specie's human

Prototype 1
Ideation

I then began to ideate surrounding this definition. How could I continue to explore making and artifact creation, and visualize the concept of human data to make the relationship between objects and people as obvious as possible?

I began to think about the most basic, essential form of making with which we interact; I knew that, if my theory of artifact creation's innateness to the human experience were correct, it would mean that the first interaction with artifacts would be in childhood. What could that be?

I *immediately* thought of the Lego, and its predecessor the building block toy. It was the most straightforward example of what we traditionally think of as making. Perhaps my visualization of human data could be of a toy; I thought it would be fascinating to look into the history of the making toy, and perhaps create one of my own!

I had a few ideas for a project, but the one that I was the most interested in included creating a toy that would further my already developed process of artifact creation and, as a result, my examination of *homo sapiens'* development as determined by their habits interacting with the environment.

My idea was as follows:

Create a toy, perhaps a puzzle, that incorporates the following sources of data (about humans, and therefore "human data"

- Use existing data and collecting my own about people's toy using habits, both as children and adults
- Universality of certain types of toys — and involvement of globalization to make universal certain toys have Legos and building blocks and dressing dolls in mind as examples
- Also the propensity for side jobs and hobbies related to making even for those who do not pursue making/manufacturing careers

Basically, I wanted to research toys as an additional metric to demonstrate that object-making was an essential human quality. I planned to find a way to embed toy usage data, both existing and data I planned to collect, of both adults and children, in the design of this toy.

I found this idea riveting! It was right up my "making alley" — a research-backed, physical object that would be a vehicle to explore a facet of the human experience.

Feedback:

Among the feedback I received from Martha and Sabrina that first week was the challenge to explain my definition of artifact creation using *only* Legos! If building block-style toys were indeed one of the beginning interactions people have with the process of artifact creation, then they should be able to represent the system of artifact creation I'm discussing.

I borrowed **Fish**'s set of legos, and two of the evenings that week *all* I did was sit and play with the physical Legos. I really didn't come up with anything of note — I thought I could make a stop-motion with the legos... then I discarded that because it was exceedingly time-consuming. I also thought about creating a data visualization... but I had not yet figured out how to exit the realm of words into the realm of images!

Ideation Pt2

The day after Studio class I had my usual individual meeting with **Jan**. I expressed my confusion, frustration, and current efforts to solve the challenge and quandary put in front of me. I was *certain* that there was an obvious, inextricable relationship between toys and artifact creation and humans, I just needed to find a way to explain it! His advice was to map *everything* out – make as many mind maps as I could, and try to find connections between all of my ideas.

"Dynamic Media" Mind Map

First we have the dynamic media mind map. I felt this map was very important because whatever theory or visual results from my explorations of object and artifact creation needed to reflect the dynamic nature of human learning and making.

My first step was to look up the definition of each of the words, and I highlighted the reoccurring terms, as well as any terms I felt like I wanted to bring into my definition of dynamic media. Then, in the box in the center of the page, I outlined *my* definition of Dynamic Media, as it concerned my Human Data project moving forward.

"Dynamic media - a force of continuous change, evolution, communication, progress, transfer of energy, and/or ideas/concepts/information.

Add: to the masses?

Add: and stores/depicts such a force/process

Does not need to be a digital output or medium.

I also reserved the terms on the side to use in thinking more specifically about the relationship between object-making and human data.

Artifact Creation As **Communication**

- communication inventions
- technical product
- bridge distance/time/ language between people/ places/ideas/information
- system of processing our environment
- meta metric
- across species & individuals
- contains truths (information) about the needs of the populous
- sharing, imparting, sending, conveying
- information

"Artifact Creation as Communication" Mind Map

Next we have the "Artifact Creation as Communication" mind map. This one surged organically out of the Dynamic Media mind map with the words "change," "movement," "update frequently," "new ideas," and "volume."

I had already used the idea of artifact creation as a means of communicating information via an object to a user in brainstorming conversations with Jan and **Andrew**, and I began thinking of artifact creation particularly as a *means of communication*; I wanted to further explore the concept.

As has been a theme throughout my work, I began by looking up the definition of "communication," which our dear Merriam Webster defines as:

"communication (noun - singular)

1a : a process by which information is exchanged between individuals through a common system of symbols, signs, or behavior

also : exchange of information

1b: personal rapport
2a: information communicated; information transmitted or conveyed

2b: a verbal or written message

communications (noun - plural)

3a: a system (as of telephones or computers) for transmitting or exchanging information

wireless electronic communications

3b: a system of routes for moving troops, supplies, and vehicles

3c: personnel engaged in communicating : personnel engaged in transmitting or exchanging information

communications (noun - plural in form but singular or plural in construction)

4a: a technique for expressing ideas effectively (as in speech)

4b: the technology of the transmission of information (as by print or telecommunication)

communication (verb)

5: an act or instance of transmitting the communication of disease

communication (noun - anatomy) : a connection between bodily parts"

- communication inventions
- technical product
- bridge distance/time/language between people/places/ideas/information
- system of processing our environment
- meta metric
- across species & individuals
- contains truths (information) about the needs of the populous
- sharing, imparting, sending, conveying
- information
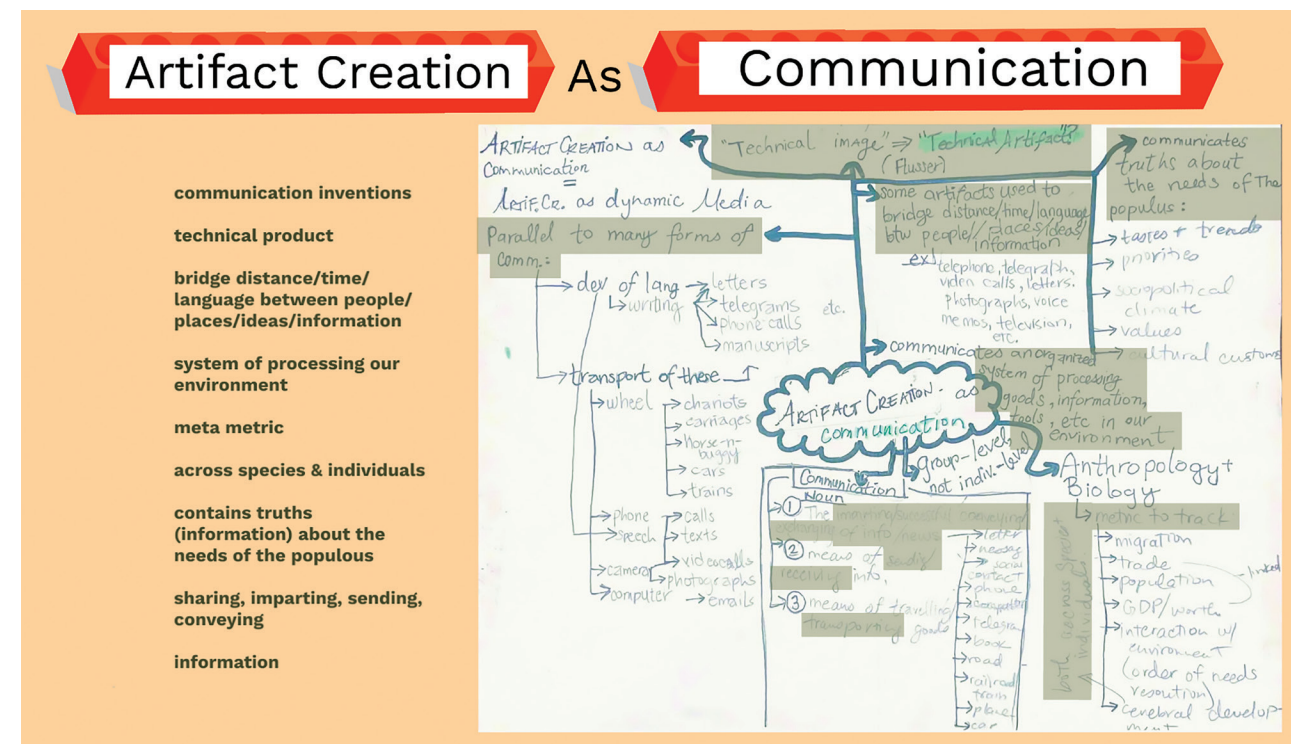
In that moment, I realized I recognized the relationship between artifact creation, objects, and communication; I had seen it before in the form of Flusser's "technical image."

Though individuals use made objects, the objects themselves are not artifacts. *Artifact creation is a process that occurrs to make the object in order to communicate a particular message, bridging distance, time, and language between people, places, ideas, and/or information.*

In other words, artifact creation is a Flusserian apparatus that creates artifacts, and these function like Flusser's technical images, in that they embed information about people and connect the user with that information.

You can see now how I arrived at the conclusion that artifact creation is an apparatus that produces "technical artifacts." Any object contains every piece of information that has led to its existence; what is contained within the object, whether it's about the object or not, is by definition *data about people. Someone* decided who, what, when, where, how and why that object came into being. That is *human data*. And the more you learn about any given product and its history, the more you can *see* contained within it.

What a discovery! I'd never see the world around me the same again.

This note triggered the *"Artifact Creation as Communication → Artifact Creation as Dynamic Media"* note.

What came next was the list of types of information artifacts communicate. I really tried to focus on *categories* of information/messages transmitted so that my list was product-agnostic.
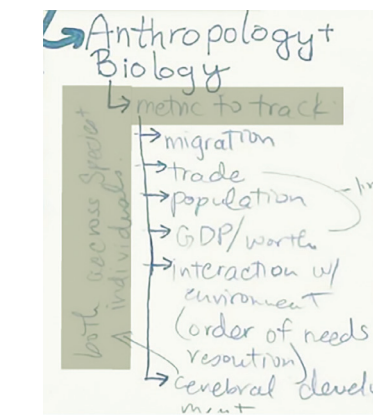
(Artifact) Communicates:
→ *The needs of the populus*
→ *Their tastes and trends*
→ *Their Priorities*
→ *Their sociopolitical climate*
→ *Their values*
→ *Their cultural customs*
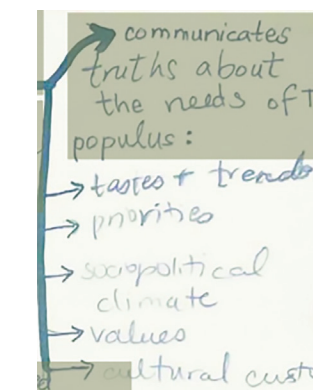
I realized this list actually focused specifically on information about *users and the context in which they lived*, but it was not the extent of the information communicated by manufactured objects.
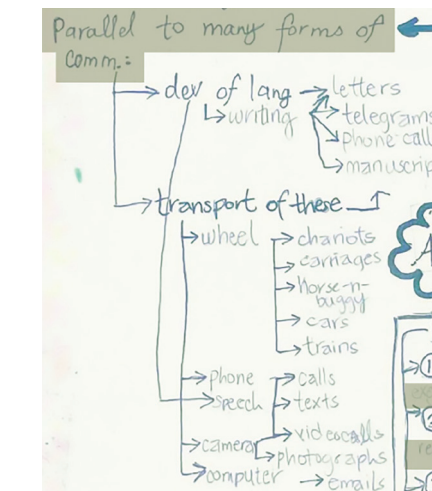
So, I then made a higher-level, more categorically general list of information contained, that fit under the broader fields of Biology and Anthropology:

These metrics *then* spurred me to list all the *means* of conveying / imparting / exchanging information / news that qualify as object creation; quickly followed by the accompanying technical artifacts that *exist parallel to and assist most forms of communication:*
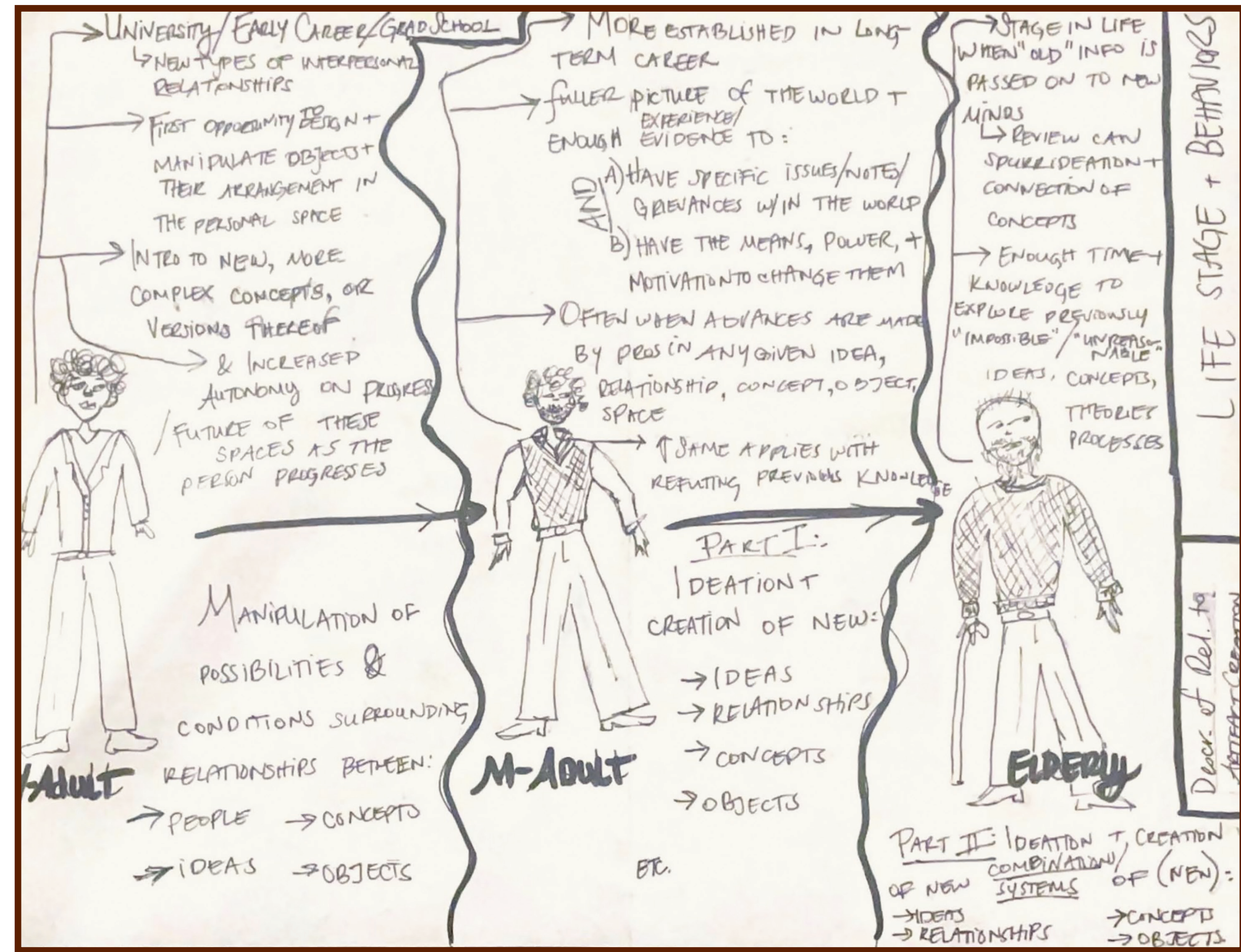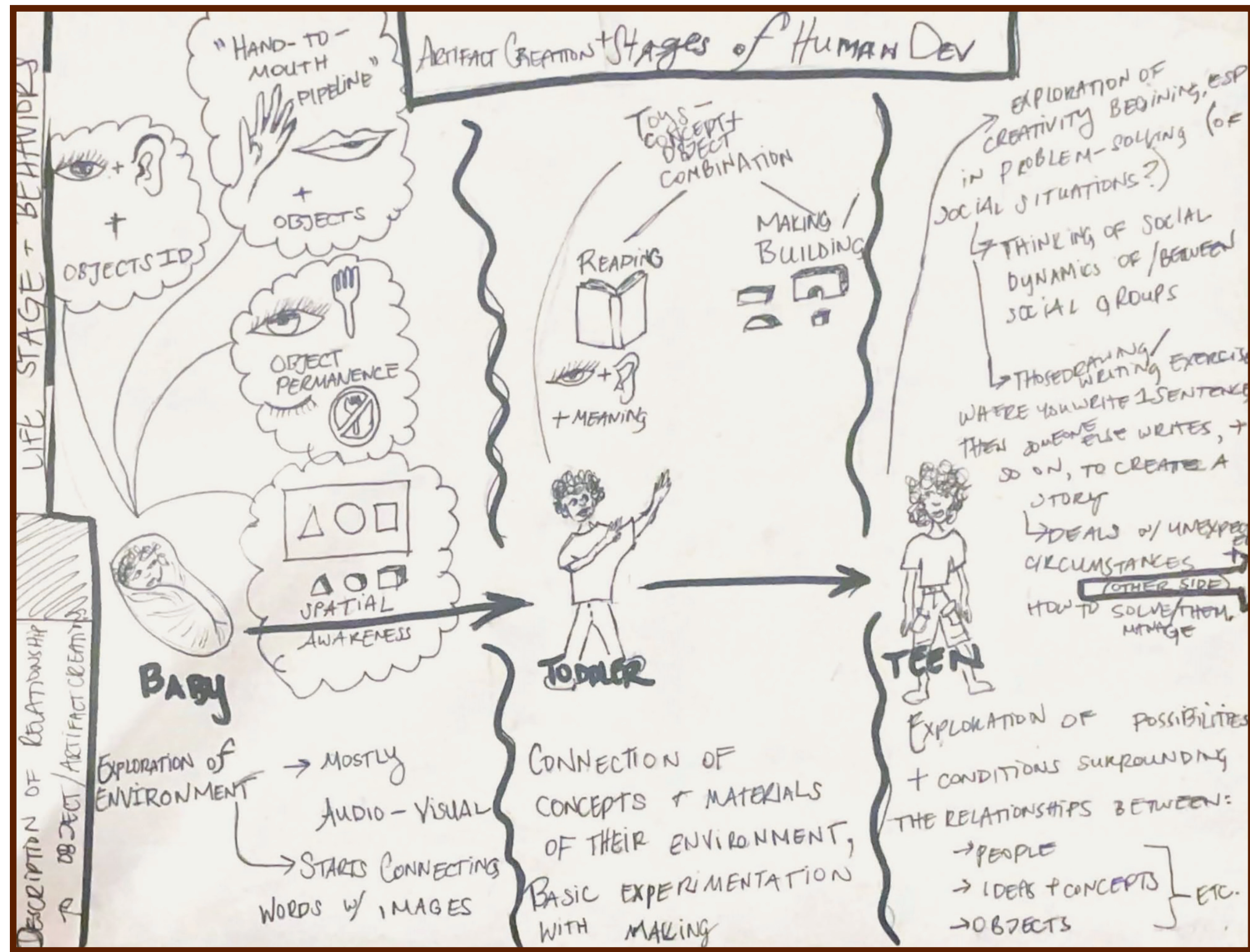

From this list I then thought of all the contexts in which these technologies are used, and noticed that there were two main categories / scales of communication: group-level and individual-level. It also became clear to me that Artifact Creation (as Communication) was at a group-level scale of communication. This made me realize *just how much of an impact* making and technical artifacts have on our world.

This is how I ended up with the next mindmap, "Technical Artifacts and Stages of Human Development."

Technical Artifacts provide us with a metric to track the following (both across whole species, on a group-level, and on an individual-level):
→ *Migration patterns (not limited to humans!)*
→ *trade*
→ *population (growth, diminishing, fracturing)*
→ *GDP/financial worth*
→ *level and type of interaction with environment (and the impact this has on other metrics on this list - ex. change/revolution of order of needs)*
→ *cerebral development*

Development of language
→ *Speech*
→ *Writing* → *Telegrams*
→ *manuscripts*
→ *Letters*
Transport of these ^
→ *wheel* → *chariots*
→ *carriages*
→ *horse & buggy*
→ *automobiles*
→ *trains*
→ *phone* → *calls*
→ *texts*
→ *camera* → *video call*
→ *photographs*
→ *computer → emails*

Left page:

LIFE STAGE + BEHAVIORS

ARTIFACT CREATION + Stages of HUMAN DEV

"HAND-TO-MOUTH PIPELINE"

+ OBJECTS

+ OBJECTS ID

OBJECT PERMANENCE

SPATIAL AWARENESS

△ ○ □

TOYS = CONCEPT + OBJECT COMBINATION

READING

+ MEANING

MAKING / BUILDING

EXPLORATION OF CREATIVITY BEGINING, ESP IN PROBLEM-SOLVING (OF SOCIAL SITUATIONS?)

↳ THINKING OF SOCIAL DYNAMICS OF /BETWEEN SOCIAL GROUPS

↳ THOSE DRAWING / WRITING EXERCISE WHERE YOU WRITE 1 SENTENCE, THEN SOMEONE ELSE WRITES, + SO ON, TO CREATE A STORY

↳ DEALS W/ UNEXPECTED CIRCUMSTANCES [OTHER SIDE] HOW TO SOLVE/THEM, MANAGE

BABY

TODDLER

TEEN

DESCRIPTION OF RELATIONSHIP OBJECT / ARTIFACT CREATION

EXPLORATION OF ENVIRONMENT

→ MOSTLY AUDIO-VISUAL

→ STARTS CONNECTING WORDS W/ IMAGES

CONNECTION OF CONCEPTS + MATERIALS OF THEIR ENVIRONMENT, BASIC EXPERIMENTATION WITH MAKING

EXPLORATION OF POSSIBILITIES + CONDITIONS SURROUNDING THE RELATIONSHIPS BETWEEN:
→ PEOPLE
→ IDEAS + CONCEPTS
→ OBJECTS] ETC.

Right page:

→ UNIVERSITY / EARLY CAREER / GRAD SCHOOL
↳ NEW TYPES OF INTERPERSONAL RELATIONSHIPS

→ FIRST OPPORTUNITY DESIGN + MANIPULATE OBJECT + THEIR ARRANGEMENT IN THE PERSONAL SPACE

→ INTRO TO NEW, MORE COMPLEX CONCEPTS, OR VERSIONS THEREOF.

→ & INCREASED AUTONOMY ON PROGRESS

/ FUTURE OF THESE SPACES AS THE PERSON PROGRESSES

MANIPULATION OF POSSIBILITIES & CONDITIONS SURROUNDING RELATIONSHIPS BETWEEN:
→ PEOPLE → CONCEPTS
→ IDEAS → OBJECTS

S-ADULT

→ MORE ESTABLISHED IN LONG TERM CAREER

→ FULLER PICTURE OF THE WORLD + ENOUGH EXPERIENCE / EVIDENCE TO:

AND
a) HAVE SPECIFIC ISSUES/NOTES/ GRIEVANCES W/IN THE WORLD
b) HAVE THE MEANS, POWER, + MOTIVATION TO CHANGE THEM

→ OFTEN WHEN ADVANCES ARE MADE BY PROS IN ANY GIVEN IDEA, RELATIONSHIP, CONCEPT, OBJECT, SPACE

↑ SAME APPLIES WITH REFUTING PREVIOUS KNOWLEDGE

M-ADULT

PART I:
IDEATION + CREATION OF NEW:
→ IDEAS
→ RELATIONSHIPS
→ CONCEPTS
→ OBJECTS

ETC.

→ STAGE IN LIFE WHEN "OLD" INFO IS PASSED ON TO NEW MINDS
↳ REVIEW CAN SPUR IDEATION + CONNECTION OF CONCEPTS

→ ENOUGH TIME + KNOWLEDGE TO EXPLORE PREVIOUSLY "IMPOSSIBLE" / "UNREASONABLE" IDEAS, CONCEPTS, THEORIES, PROCESSES

LIFE STAGE + BEHAVIORS

DESCR. OF REL. TO ARTIFACT CREATION

ELDERLY

PART II: IDEATION +, CREATION COMBINATION / SYSTEMS OF (NEW):
OF NEW
→ IDEAS
→ RELATIONSHIPS
→ CONCEPTS
→ OBJECTS

If the reach of making and artifact creation in our society is indeed this widespread, going back to the youth of our civilization, and it's clearly following some sort of pattern of development, then there must be a microcosm of this process extant in the stages of one human's development.

In this Mind Map, I broke down the process of artifact creation into its "developmental building blocks," as they correspond to a rough sectioning of the stages of human development. Also detailed in the top portion of the chart are the associated human artifact creation behaviors of each stage, with a focus on building and combining objects, sensory perceptions, ideas, concepts, and so on. The big conclusion I took away from this mind map was that the development of a technical artifact was catered to a particular set of needs, environmental challenges, and/or problems being dealt with by a human, or a group of humans, at that given point in time.

What's in a Lego?

Having done all of this thinking, I returned to my box of Legos, trying to visualize all that I have outlined above. In order to process my thoughts; desperate to explain what I was thinking and using Lego as an example as best I could, I made the presentation depicted on the left. .

In it, I attempt to outline the relationships between technical artifacts, making, and human data, and attempt to use Lego as an example to illustrate this relationship. It took me a while to realize that I had a framework to describe the relationship between artifact creation, humans, and the objects that resulted thereon, so the explanation of Flusser, his technical image, apparatus, and my extrapolation of the "technical artifact," comes late in the presentation. What I was left with was a presentation that, I felt, drew a clearer line between the meaning of Human Data, object-making, the human experience, and technical artifact creation.

Feedback

There was also a point in the presentation where I found myself losing the grip on my idea because I hadn't finished thinking it, and I was finding all the changes and improvements it needed while presenting, in real-time, which made it difficult to communicate clearly. Martha, Sabrina, and my peers were very receptive to my confusion and frustration, and suggested that I take on one relationship between two concepts at a time. After sensing my hesitation to abandoning the complex connections, I remember Sabrina saying something along the lines of "We are not saying you have to abandon any relationship, but rather for you to tackle them individually before figuring out how they fit in together;" she encouraged me to do a little bit of work exploring each of the 3 relationships, and see where that leads.

Logically, I could see the benefit – we only learn about complex relationships one variable at a time in school, and then spend the rest of our careers trying to wrap our (and others') heads around these complex relationships. But I felt like I had a good enough grasp on the individual concepts, and their individual relationships. The nuance of the intersections was what was evading me – and if I've learned anything from intersectional feminism and activism, it's that the importance (and greatest impact) of these relationships comes in context. This context just happened to be very... complicated and convoluted. I know it sounds cheesy, but detangling that ball of nuances (specifically within the lens of design and fabrication) felt (and continues to feel) like my calling.

One thing was clear to me from this presentation and feedback - the lego idea was not working.

Something that encouraged me was discussing this day with Andrew. I have developed a great friendship with him, based in mutual admiration and respect for each other's work, and often find myself reaching out to him for a frank and nuanced assessment of how my work is being perceived by the class. After this class, Andrew and I had been messaging, and he sent me his notes from my long talk, which I've included here for 2 reasons. Firstly, they're beautiful! I am in awe of his drawing abilities. And secondly, they gave me great insight into how my presentation came across, where the relationships were being followed, and where I lost my audience.

Prototype 2 : Make it physical!

Form & Function Ideation

What I couldn't figure out for a few days after that presentation was how, when, and where exactly the Lego example went wrong, despite Andrew's notes indicating that I had done a better job than I thought communicating the complex relationships and definitions I was grappling with.

Reassured, I began to digest the feedback by consulting my professors and peers. In addition to Andrew, I first spoke to Jan, trying to piece together what the issues were with the visual, and where I lost my audience. Jan was the first person I reached out to to chat for a few reasons:

1. He had read my history of artifact creation work, so he knew where I was coming from in that regard

2. Jan had originally assigned the Flusser "technical image" reading, so he was intimately familiar with the theory

3. He is one of my thesis advisors! I had kept him abreast of my work and progress thus far.

As usual, I made significant headway during that meeting, that helped me realize a few things about next steps:

1. I was ready to make something physical! I felt that if I did, some of my doubts or questions might be answered by the limitations of the physical form, or the visualization of these relationships in 3D space.

2. We talked about whether I wanted to refer to the technical artifact process as container or a memory, and the pros and cons of each

   I stuck with container – I decided that the memory involved came on the part of the user, not of the object, and that memory implies sentience, something I was not ready to attribute to the object

3. We toyed with the idea of technical artifact creation as a web of decisions; a system of systems of problem solving

In deciding to move on to working in 3-dimensions, Jan and I also discussed the form factor:

1. We returned to Flusser's technical image idea, and we continued the development of the term "Technical Artifact" - the object as the outcome of the systems of decisions that design the object, and the object as a container of these decisions and the information that composed them within the product. Whatever form I would decide upon needed to contain and show all of these details / complexities.

2. We assessed whether Lego would work as a form factor, and ultimately decided against it for a few reasons:

   → It does not lend itself to peeling back the layers of information, because it was not openable. Whatever I created needed to function as a physically interactive model.

   → I was talking constantly about a container of information, so it would be beneficial for me to attempt to model that system of information containment with a physical object that had visually obvious layers. I kept referring the mechanism of a Russian nesting doll, where the layers open to show what's inside

   → I didn't want to use a specific, known object because people would have a hard time separating their individual experiences with said specific object from the group/species-level problem-solving and historical information contained in any given object (a theory which I promptly tested afterwards with my sibling and their partner, and which rang true)

3. I had an epiphany about what style of object – I had thought of a nested gift box (like the one below) I had interacted with in the past, and I could paint it black to obscure a reference even to a box.

   → Jan's suggestion was "an object that indicates that it is openable, but that it is not immediately evident how it is to be opened, so people have to investigate." - citing the inspiration of a puzzle box

Chocolate explosion box tutorial| How to make Explosion box| Sheetal Khajure Ankalkote

11:35

I felt immense progress - I thought I had finally figured it out! I was going to make a series of nested boxes that represented and explained to the user the layers of information within them.

My next victim was Joe; though no additional earth-shattering realizations were made, as I walked him through the idea I had developed with Jan and received positive feedback, I felt increasingly sure about needing to make a physical visualization next.

Form Prototype

Finally, it was time to make something physical!

I found a tutorial for how to make the boxes, got the measurements, and decided to make it out of the cardboard I hoarded in my basement from moving.

Making 7 nesting boxes takes longer than you think! Just marking and cutting out the cardboard took an entire evening, and then came painting them (which I did by hand, because the black spray paint I had wouldn't stick to the tape I used to put the box together). These were then glued together by their central panel, as pictured below.

Context (UX Des) prototype: How is contained info organized?

When I was finally done building the form, I bounced back to the conceptual space to design the exercise. I really wanted to provide a process of inquiry that analyzes the complex, relevant realities of the object maker's physical and conceptual environment, visualizes otherwise invisible patterns of behavior present in the artifact creation process, and encourages reflection on how that information and those connections can guide our species' development and societies' future.
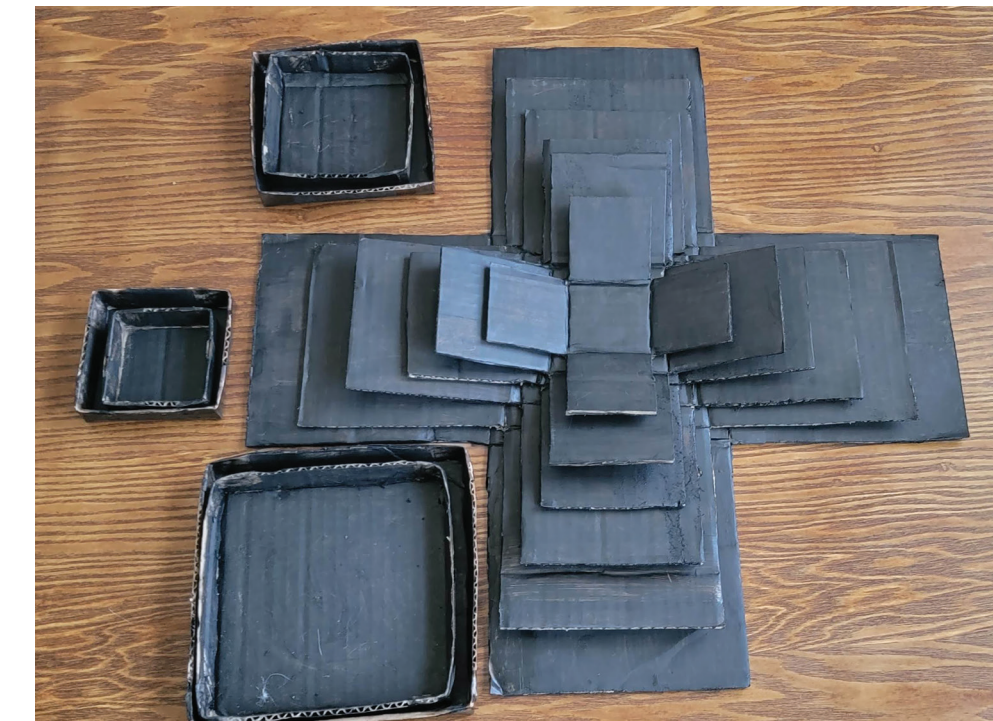
I first needed to decide which categories would be included. My two prerequisites for these were that they would apply from a single human level all the way to a species-wide level, and that they would be product agnostic. My preliminary list of stored categories of information was as follows:

1. Human Cognitive Evolution
2. Needs for Surviving and Thriving
   → Based on Maslow's hierarchy of needs
   → You can be addressing any one or combination of them at any given point in time
   → Contained in the artifact - ticks one or more of these boxes for the user, maker, target market, or the state we're in as a society
3. Sociocultural and sociopolitical data
   → Sociocultural and sociopolitical context from which the item or idea emerges
   → Society-wide version of ^
4. Previous product evolution
   → Object "contains" previous versions of the project (object's "lived experience"/ "heritage")
5. "Local," individual-level contexts from which the item or idea emerges
   → Problem being solved
   → Gap/need being addressed
   → User feedback being applied
   → Method of fabrication
   → Material being used

In thinking about these categories, I came up with the following titles for them:

1. Human Cognitive Development
2. & 3. Sociocultural Significance
4. Product Evolution
5. Manufacturing

I also tried to keep my user experience in mind; it was important to me for the experience to feel narrative, and I knew I wanted the box to be quite interactive. So, I tried to make sure that the phrasing and communication was interactive, and as graphic as I could make it. As an initial prototype, the labels were drawn on by hand. (see above)
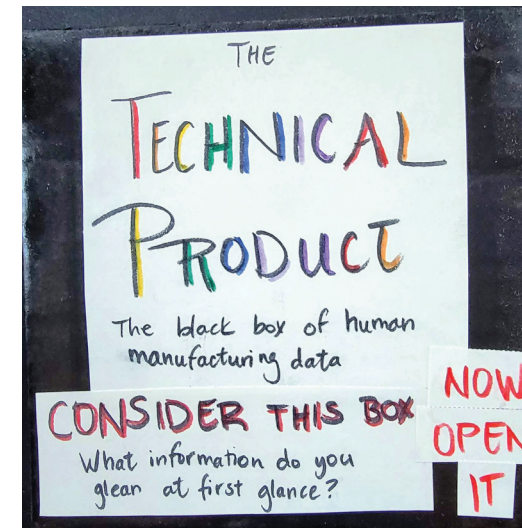
Feedback

This week Martha and Sabrina had invited guest critics for our presentation updates. The feedback from the guest speakers was absolutely incredible. I appreciated their clarification questions, as they helped me understand where my communication of concept and form factor were lacking, and helped me narrow in on which details to keep in the theory and which are not absolutely necessary. I have included a set of notes of the guests' feedback that I attempted to address immediately moving forward.

Kimberly Lucas:

Tactile/sensation element being included

Empathy - to get someone actively physically involved is to get them [mentally/emotionally] involved

I was very pleased that she picked up on the intention I had set out, to make people care by having them bring this process into their bodies by moving while thinking. Wandy Pascoal:

Talk about who creates the product, lends itself to empathy

Reading Capital by Carl Marx - often talks about if a process is abstracted, that means you can't pinpoint when someone was exploited, when materials were also extracted and exploited

Question for me:

Is somebody who is encountering this "nesting box" unpacking the experience of what led to the creation of a single product/object, and that you're providing them that object?

OR

Are they applying those questions to whatever objects are in their environment?

So the first points I was very grateful for, because Wandy's wording helped me see how I might incorporate the element of human labor and life and abuse that permeates the capitalistic side of the manufacturing space.

I'm not sure I was ultimately successful in incorporating this activistic element into the final product, but her feedback helped me digest the involvement better and was kept in mind when developing the final product.

Stephen Walter:

Object-oriented oncology - playful, philosophical field
   Treat objects with equal precedence as entities w volition
   Speculate as to what it is to be that object
   Writer: Ian Bogost
Trans* - book written by Jack Halberstam
   Dive head-first into the metaphor of the lego as building oneself/ one's own identity over time
   'Manufacturing oneself'
Wittgensteinian language game quality to it
   Definitions based on context
   Literal language game
Question: *What are you trying to get people to leave with, and who are those people? What is the impact/aha moment that you're helping people to come away with?*

I immediately added those reference and reading materials to my to-review list, and proceeded to answer his question.

This project has 3 main goals:

1. A framework with which to analyze the layers of their environment
   What I have is not specific to a product, or anything inanimate, or disembodied
   The way I hope people will view the world - no simple existence, animate or inanimate
2. Understanding that everything is made as well as being multilayered
   Created and structured
   By time, people, experience

Sabrina:

Story of stuff – super old, about lifecycle of it, you dont think about it, but there's all this missing knowledge
Games - Little Alchemy (II)
   Take an element, combine w other element, see what's made
   Thinking about whether it's physical or not
   There's a place to help people make the journey in their mind about how things are connected

All in all, I had a lot to think about and review.

Box Layer and Content Organization

I walked away from the feedback from our guest speakers to mull over, once again, how best to visualize the relationships between Human Cognition, Product Evolution, Manufacturing, and Sociocultural Influences, and how these manifest over time in the technical artifacts that are created. I moved to focus, in the next version, on the interactivity – how do I get people to think about these connections, and keep them in perspective out and about in the "real" world?

In the last week, I had pondered how best to structure the four categories of information I had decided to include into the 6 nesting boxes, and how to support the metaphor of the Black Box. I hesitated on which direction to take next. As things stood, I had two options:

1. Find a way to explain the relationships of these four complex themes by modeling one layer to one theme, using the box's layers, and connect that to the abstract concepts, and then make an additional box to represent an example product, or multiple example products.

2. Use the mindmap I had already developed about Human Cognition and its relationship to object and artifact creation to define the layers (each layer = a different product in the cognitive development process), and then use those to figure out how to organize the information in each remaining category. In this idea, each category would be represented in each box.

I decided to go with the second, though in retrospect I feel it would be awesome to make the first as well! I did some quick user research to support my decision, conferring with Jan, Joe, **Cédric**, and Andrew about how best to present this information.

My first step in this process was to define the range of the boxes. Since I decided to use my Human Cognitive Development mind map as a base, that one had 6 boxes, so I decided to abandon the smallest one. In addition, I ran into the issue of scale. The smallest box in the series is quite small (2"x2"), so to contain this information on such a small scale would be so inaccessible, whether the font were decreased to fit on to the space, or a larger sheet were folded onto the side and had instructions to open up.

Should I give the box an intentional orientation? This was something I discussed with Jan, who emphasized the importance of the choice of arrangement and how it will change the message I send based on which side of the box I decided to assign each category. I decided to organize the layout of the categories' distance from the user based on how well the average person would be acquainted with the information represented. The Human Cognitive Development side would be closest to the user, as I felt that was the category about which any given person would have the most amount of intimate knowledge. On either side, I placed the Product Evolution and Sociocultural

Significance categories; I felt that, though any given person knew less about them, reaching the information was more accessible. And finally, on the side farthest from the user, I placed the Manufacturing section, with the logic that this was the section people would know least about, and was the most difficult information to "unlock."

Human Cognitive Development (HCD)

I referenced the Human Cognitive Development mind map (p.38 - 39) to decide on how to organize the box "timelines" (that have a basis in abstract time).

Having decided to assign each category a side on the boxes, I decided to have the Human Cognitive Development side move from the newest, most mature version of the object on the outermost box, to the oldest, most fundamental and simple version of the object on the innermost. In particular, this layer can be used to identify the problem or challenge humans faced when the object was devised; each layer of the HCD shows the category, maturity, complexity of the exploration of human existence relative to the version of the object created.

Product Evolution (PE)

The Product Evolution side focuses on the versions of the object itself as it transforms from a problem / challenge to an idea to a reality. It mimics the design process, and shows how a simple, unrefined idea as a result of a conflict between a human and its environment can evolve to be a technical artifact – the evolution of its form and function. As with the previous category, PE was divided into 6 sections, with the final product being represented in the outermost layer, and the idea and ideation being represented in the innermost layer.
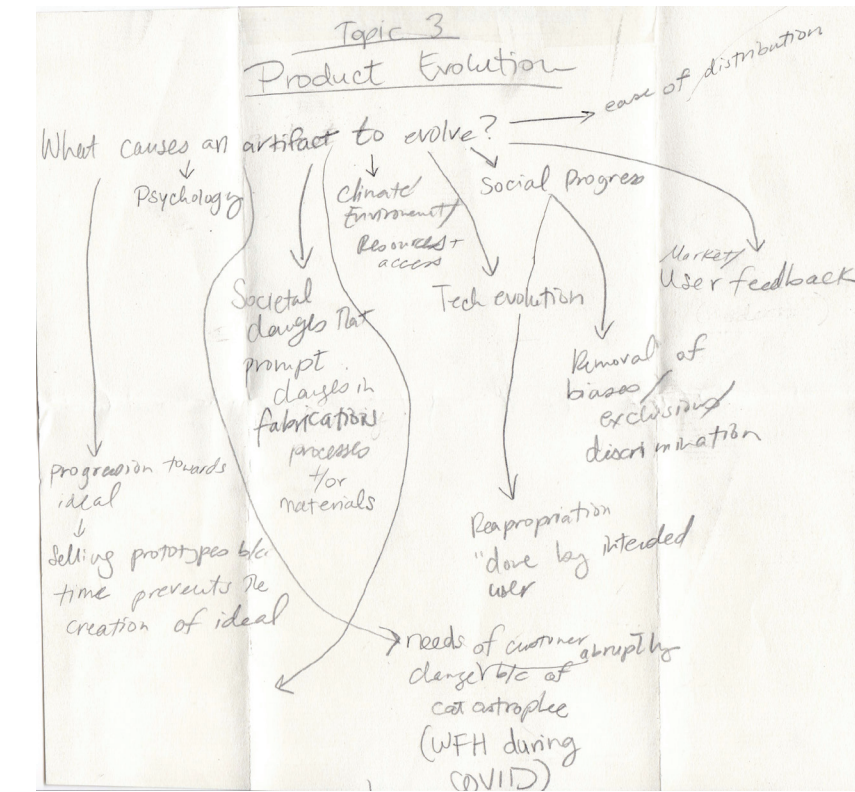
Manufacturing

This layer focuses on the fabrication part of object creation. Decisions about material choices, fabrication techniques, and systems of thinking about design that influence the resulting object all fall under this category of stored information. Of all the categories, this is one the average person might know the least about, which is why I placed it on the side of the box intended to be farthest from the viewer. By forcing the viewer to stretch, reach, stand, or walk around the piece to access the information on the Manufacturing side, I wanted to create a parallel to the work the average person must do, the knowledge and training they must acquire to understand the features of the manufacturing of a given object.

This side of the boxes would consist primarily of comparing and contrasting each version of the object to its previous one within the categories of Materials, Techniques, and Systems for fabrication. The information on each layer also prompts the viewer to be(come) aware of how these categories change over time by highlighting how the availability and variety of materials, techniques, or systems of design have changed as the object goes through its various versions.
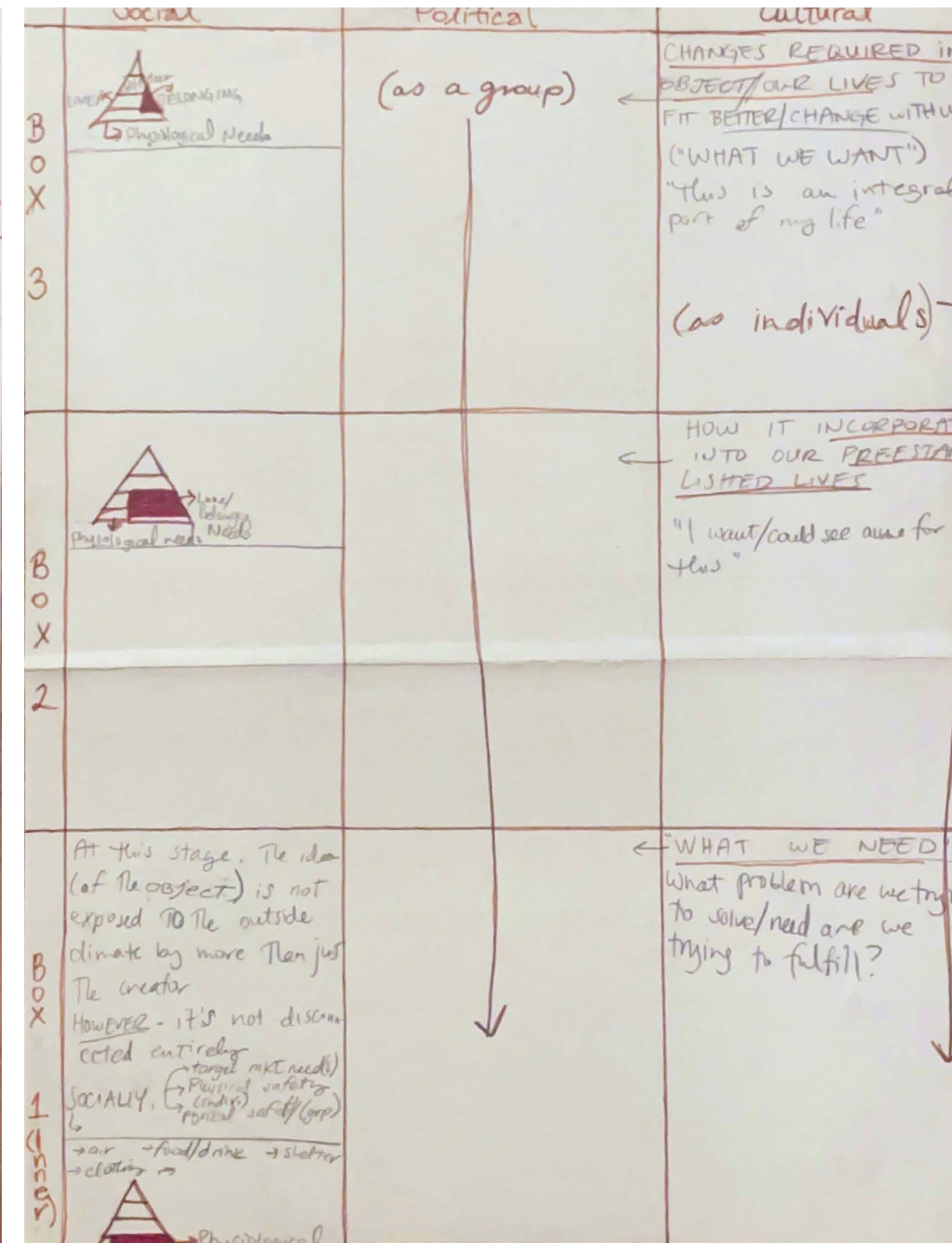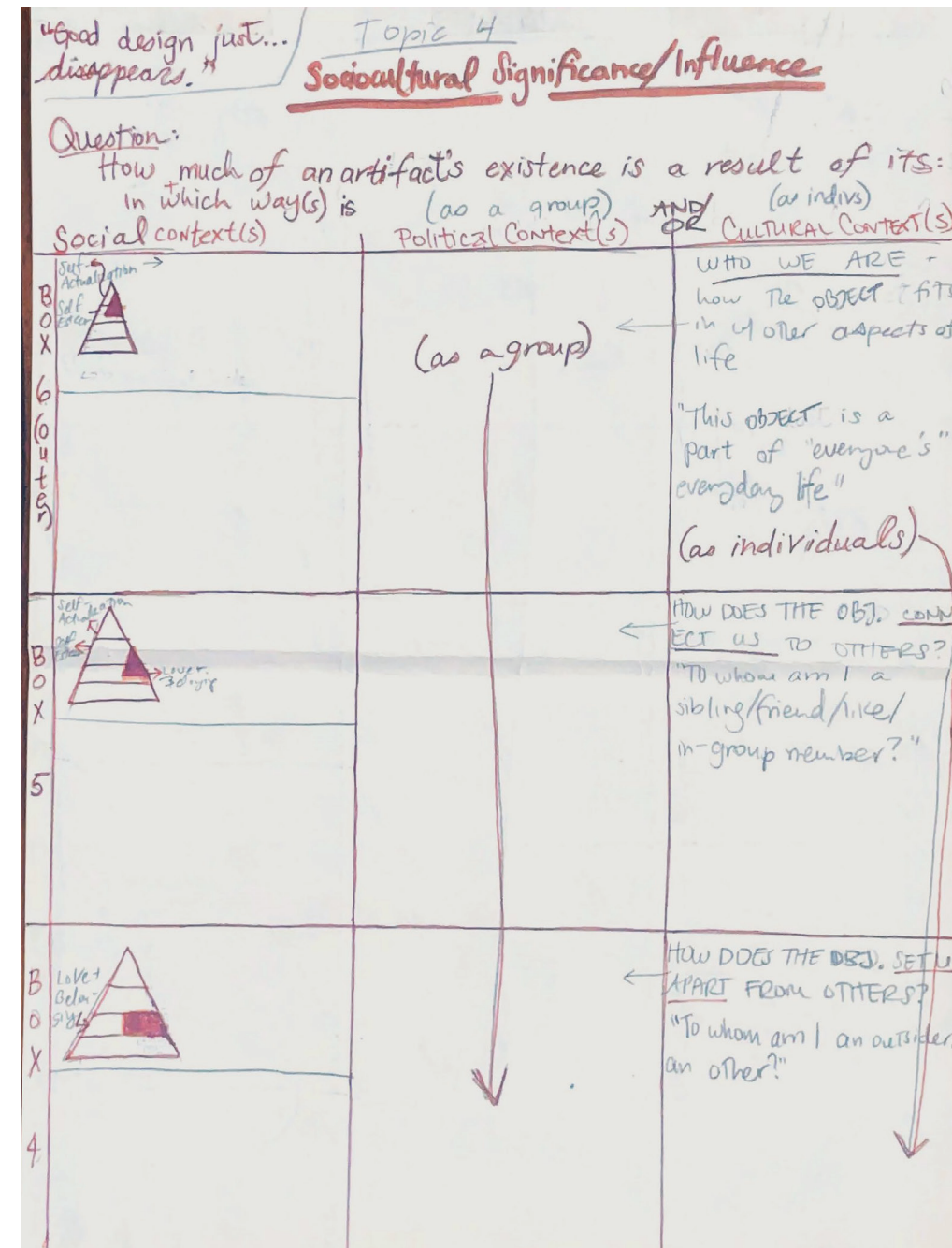
Sociocultural Significance (SCS)

Last but not least, the Sociocultural Significance layer. SCS refers to the portion of the information contained in the object that encodes the culture, society, and time period that the person, challenge, and object originate in, as compared to their past. This includes details such as political climate, local culture and its aesthetic and functional preferences, the object and challenge's placement on Maslow's Hierarchy of Needs, and in-group / out-group roles and dynamics.

On the innermost layer we have the Physiological Needs portion of Maslow's Hierarchy, the bottom-most layer of the pyramid, which addresses the question "What problem are we trying to solve, or need we are trying to fulfill with this object?" As we progress through the boxes, the information covers the range of the pyramid of human needs, ending with needs of Self-Awareness and Actualization and the question of "How does the object represent who we are, and fit in with other aspects of life?" on the outermost layer.

All layers of information are subdivided into Political vs Cultural, or "as individuals" vs "as a group."

Feedback

I had one final opportunity for feedback from my peers before building the final model; I am so grateful for the feedback everyone gave me. It showed me why designers, by necessity, work in groups – no matter how simple the solution, if you're buried too deep in the topic, it will not be evident for you, and an onlooker with an outside perspective will more easily see it; and that is not a reflection on your intelligence, it's just a matter of perspective.

There were two most important pieces of feedback I received that day. The first was simple, and came about in different words from everyone, but the way it stuck in my memory could be summarized as "you're so focused on telling people what they should walk away with, why don't you lead them through and add an element of interactivity by having them ask themselves questions about these layers?" In the final version of the project I changed the display of information to be inquiries the viewer could use to explore the idea of an object, or use an existing object as an example.
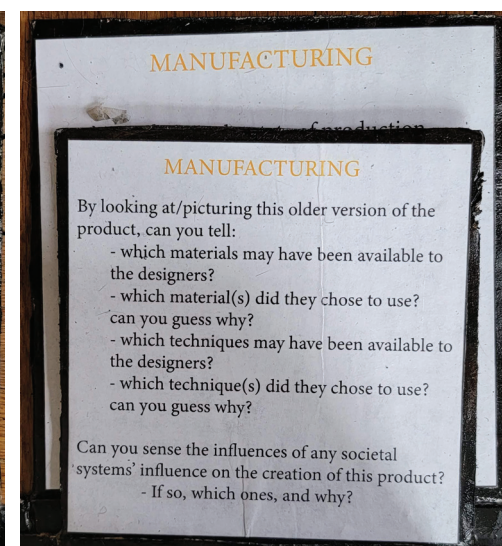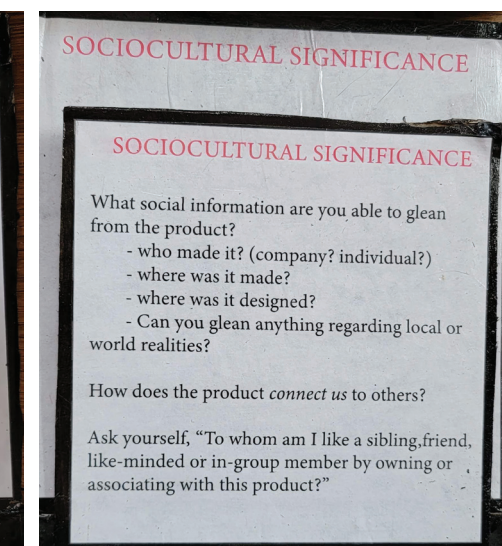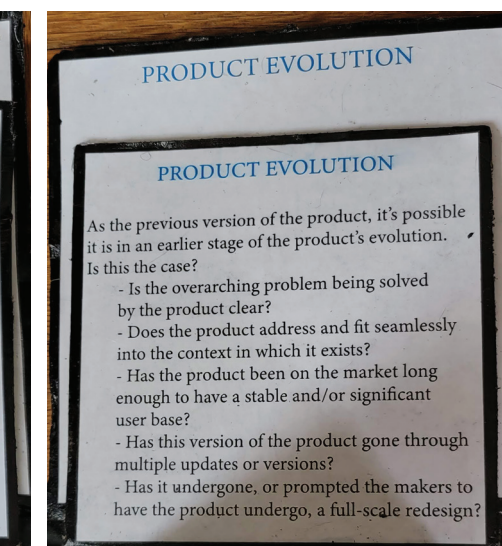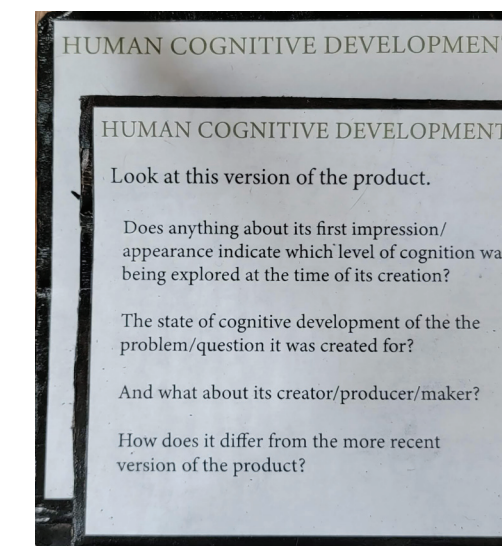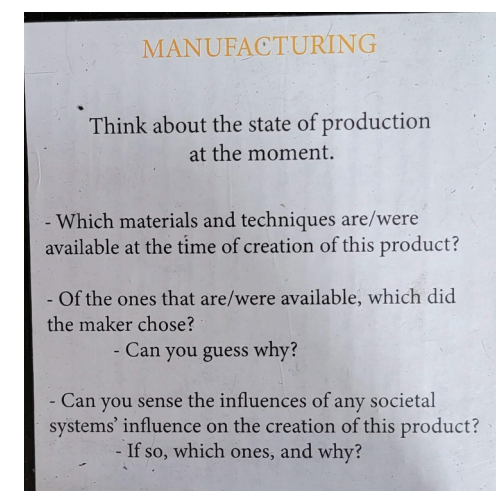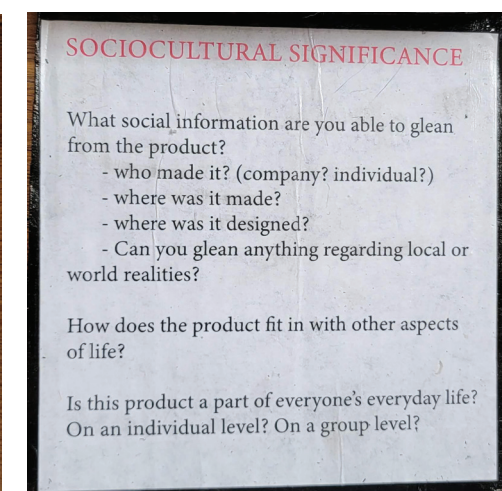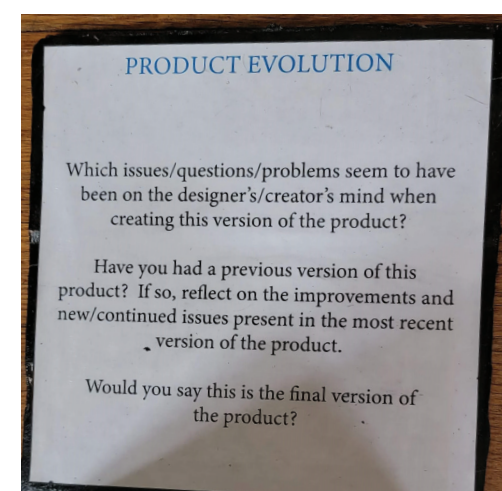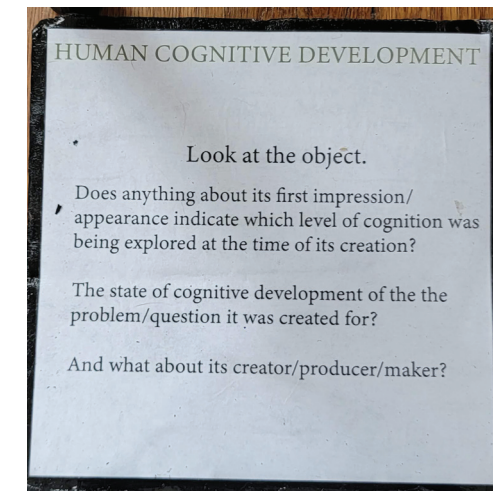
The second is smaller, but Anisha suggested filling the smallest / remaining box with mirror shards, so the user could put the example object they were analyzing in at the end and "see" the layers in the object.

What a brilliant idea! I immediately incorporated it into the next iteration of the box.

Prototype 3 - "Final"

"Technical Artifact Creation as Human Data" as a thought provoking, educational, and cognition development tool

The Technical Artifact intellectual model decodes the "black box" of human artifact creation data, leading the user along with questions about an object they choose to model. It encourages the user to ask themselves questions about their object, in order to understand its complex existence. The final product, showcased in the photo gallery here, is the first of many attempts to encourage people to have more empathy for their fellow humans by teaching them how to understand the complex histories, relationships, decisions, and experiences about people contained in inanimate objects/ideas/systems, to increase the chance that they will view the world around them, the people around them, in the same, nuanced way.

HUMAN COGNITIVE DEVELOPMENT

Look at the object.

Does anything about its first impression/appearance indicate which level of cognition was being explored at the time of its creation?

The state of cognitive development of the the problem/question it was created for?

And what about its creator/producer/maker?

PRODUCT EVOLUTION

Which issues/questions/problems seem to have been on the designer's/creator's mind when creating this version of the product?

Have you had a previous version of this product? If so, reflect on the improvements and new/continued issues present in the most recent version of the product.

Would you say this is the final version of the product?

SOCIOCULTURAL SIGNIFICANCE

What social information are you able to glean from the product?
- who made it? (company? individual?)
- where was it made?
- where was it designed?
- Can you glean anything regarding local or world realities?

How does the product fit in with other aspects of life?

Is this product a part of everyone's everyday life? On an individual level? On a group level?

MANUFACTURING

Think about the state of production at the moment.

- Which materials and techniques are/were available at the time of creation of this product?

- Of the ones that are/were available, which did the maker chose?
    - Can you guess why?

- Can you sense the influences of any societal systems' influence on the creation of this product?
    - If so, which ones, and why?

HUMAN COGNITIVE DEVELOPMENT

Look at this version of the product.

Does anything about its first impression/appearance indicate which level of cognition was being explored at the time of its creation?

The state of cognitive development of the the problem/question it was created for?

And what about its creator/producer/maker?

How does it differ from the more recent version of the product?

PRODUCT EVOLUTION

As the previous version of the product, it's possible it is in an earlier stage of the product's evolution. Is this the case?
- Is the overarching problem being solved by the product clear?
- Does the product address and fit seamlessly into the context in which it exists?
- Has the product been on the market long enough to have a stable and/or significant user base?
- Has this version of the product gone through multiple updates or versions?
- Has it undergone, or prompted the makers to have the product undergo, a full-scale redesign?

SOCIOCULTURAL SIGNIFICANCE

What social information are you able to glean from the product?
- who made it? (company? individual?)
- where was it made?
- where was it designed?
- Can you glean anything regarding local or world realities?

How does the product connect us to others?

Ask yourself, "To whom am I like a sibling, friend, like-minded or in-group member by owning or associating with this product?"

MANUFACTURING

By looking at/picturing this older version of the product, can you tell:
- which materials may have been available to the designers?
- which material(s) did they chose to use? can you guess why?
- which techniques may have been available to the designers?
- which technique(s) did they chose to use? can you guess why?

Can you sense the influences of any societal systems' influence on the creation of this product?
- If so, which ones, and why?

The Technical Artifact Blackbox At Fresh Media 2023

I had the opportunity to update the *Blackbox* and show it at the 2023 Fresh Media Show, where it was first exposed to a large audience. I made a few changes to the form for the show - namely, eliminating the empty layers to streamline the experience and the look, and affix the box to the pedestal to test out the impact of my choice of placement of each of the categories of information. I received some pretty positive feedback about the experience and the ideas with which I was toying, but it was hard to determine the piece's success in a crowded gallery opening – it was perhaps better in a context like as a classroom exercise.

Future Applications / Next Steps

This project has an infinite number of future applications and next steps!

For this particular model, I would like to finish the layers. For the sake of time and simply modeling what the project would be like to use, I only did 3, but I want to fill it out.

Secondly, I'd love to remake it, or make a future version out of better material. I didn't enjoy how much time it required to paint, as the spray paint did not stick to the cardboard or tape well. Additionally, just from handling it to take from one place to another, showing the layers to people as I was developing the project, and opening and closing it to shoot video footage, the corners of the cardboard started to fray and the layers started to come apart.

Additionally, I'd love to bring the box to a variety of locations and contexts to collect some data on audience exposure and user testing! Ideally, I'd love to expose the concepts to a variety of audiences, and see what changes need to be made for the concept to be more accessible. In particular, I'd love to conduct workshops in classrooms to refine the inquiries and the experience of interacting with the box as a tool.

From a presentation perspective, I would love to have made an additional connection/comment/step regarding the individual categories across the sides of all the boxes. Perhaps, in a future workshop or video exercise, I could have a section that leads the user to inspect their object across one category's layers at a time, rather than all the categories based on one layer.

I also thought of making an AR Fractal! Each layer would be assigned a logo that, when scanned, would display a visual of the information of that layer and how it's interconnected, forming an image that would be repeatable, and can be looked at infinitely, and that nesting is reflected in the projected systems that display when the logo is scanned. A layer's logo would be incorporated into the next layer's AR fractal as a smaller version of the image.

There's also the matter of the unused surfaces - the insides of the box tops; the out-sides of the box sides. I know that negative space is as important as designed space, but I'd love to explore which opportunities I'm missing to share more information by leaving this blank.

As for other project version options, I also thought of making a life-size, exhibition version of the box that focuses on questions of empathy within and between humans, with the participant as the object being examined. I picture an exhibition consisting of a series of rooms that don't seem like boxes, with the smallest "box" room fits a standing human, and it's covered entirely in mirrors. Then, the final stop in the walk-through of the exhibit is on a platform above the rooms, where you REALIZE they were boxes. This idea could help teach participants to see people as the complex beings that

they are – no one box or side of the box describes them, and that is true of all entities in our reality. I would want them to walk away viewing the world in that manner. Perhaps this version of the box gets incorporated in the exhibit as the first layer, to prime the participants.

As you can see, there are so many possibilities to continue this project, or to use as a jump off point.

Conclusion: How do we learn to perceive objects in order to glean what information they encode about people?

Objects are containers of human technical artifact creation data, and my *Blackbox* and its leading questions allow the user to explore the complexities of the objects and people that surround them, and their relationship to each other. On its own, I hope that the project will result in more empathy (and a bit of humility) in those that interact with it, that they might spread this system of thought and empathetic response far and wide. In wanting to teach accessing this contained information to other people, I've learned that sometimes making people ask themselves questions and give themselves answers is more effective than being told the information. In order to teach them, you have to help them be curious about their world.

This project made clear to me just how much we have to learn about the information encoded into objects, and in turn about our own history and challenges as a species. It is clear that our average awareness of the information contained in objects is pretty sparse, and it is reflected in our society. Contained information helps us understand our experience as humans better, how humans are part of Nature generally, and the animal kingdom and our biome, in specific. This missing understanding of objects as technical artifacts extends throughout our current society, and it connects with big issues as the empathy deficiency for others as well as other inhabitants of planet Earth; it connects to mass extinctions, to the slew of decisions made to prioritize profit over people's and being's needs, and to the resource access inequality present throughout the modern world. I firmly believe that, were we to value and prioritize the learning about and understanding of our humanity and Nature through the understanding of technical artifacts, we could begin to mend as a planet and build a future that reflects this growth.

With my desire for all to acquire and appreciate this perspective, I began to imagine a world in which that is already the case. I also wonder how having this perspective changes the trajectory of the evolution of the human species. In my next exploration, I ask myself:

What could a world look like in which we have capitalized upon the powerful relationship between people, objects, and artifacts to drive the growth of our society and the evolution of our species?