

Designing a posthuman through science fiction stories

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Abstract

Posthumanism as a concept is more relevant day by day as we try to understand humanity's future. As designers, the challenge lies in how to do posthuman design. There is little research and knowledge in the field of design about the possible processes through which to make posthuman design. This thesis investigates the possibility, process and details of using scifi prototyping as a method for posthuman design.

Using artistic research as the main research method, the process of scifi prototyping was explored through an autoethnographic analysis. Focus groups were conducted as a design validation tool outside of artistic research, creating a mixed methodology approach.

The thesis shows that a modified scifi prototyping method can be used to do posthuman design. Additionally, basic requirements for a functional scifi prototype in the field of design were compiled with data from the focus group analysis. These requirements include the need for exposition, immersive qualities, sufficient detail and understanding of inherent bias of the researcher.

Limitations of this research are related to the subjective nature of a creative process and the product of a scifi prototype being a story, which is a highly subjective form of media. Further research should further iterate on the modified scifi prototype method by using it and aim to create more robust guidelines for successful scifi prototypes for posthuman design.

Keywords: scifi prototype, posthuman, cyborg, design process, artistic research, autoethnography

”I do not fear death, but I also won’t welcome it with open arms.”

The Author

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1 Introduction

Here is a question that I find interesting: What does a posthuman look like and how would we design a technologically augmented cyborg that is truly something other than what we now think of as "human"? This is not exactly a new subject of interest for humanity in general, but with technology playing such a massive part in our lives I feel that the subject becomes more prevalent every year.

There are articles, books, movies and other media made about how we as a species are going to evolve, change or be forced to modify ourselves either by technological or biological means the longer we exist. So what are they going to look like? How are we as a species going to achieve this evolution or whatever it is? How is our environment going to change when we become augmented? Or do we adapt because of the environment not tolerating us any longer, when it gets uninhabitable for the future homo sapiens? How do we design these posthumans? In the field of design research this specific subject has not been explored yet, especially when done through methods of artistic research.

Herbrechter (2014, p.111-112) uses the term "technological posthumanization" which is a good way to describe the posthuman cyborg this thesis is interested in. Cyborgs, cybernetic organisms, are in my opinion almost synonymous with the concept of technological posthumanization. They are also something I myself gravitate towards whenever a futuristic vision of humanity is in discussion. Through Herbrechter's (2014, p.83) writing about a culturally represented cyborg and how this is already a concept with its own world view included I note here that I like cyborgs, therefore I am already biased towards a future where they are realized. My version of posthumanity is not neutral, but one that requires either acceptance or rejection of the cyborg idea. Because of my bias, this thesis could be read as cyborg propaganda of some sort. I am an insider, trying to show you what a version of posthuman cyborgization could be.

The research questions in this thesis are "How can science fiction prototyping be used for posthuman design?", which then serves as material for answering the secondary question "What are the requirements for a successful scifi prototype design?". These

questions are explored through the means of artistic research, autoethnography, scifi prototyping and focus group interviews. This thesis adds insight into how a designer designs. As one of the goals of research is to add into a pool of knowledge, researching design as an act is the pool this thesis adds into.

Here is a summary of what this thesis contains:

- **Section 2** Here the themes of the thesis are introduced through literature on posthumans, cyborgs and a look into cyborgs in science fiction.
- **Section 3** This section introduces artistic research methods used to explore the themes.
- **Section 4** Here the scifi prototyping method is defined. Focus groups as a tool for gathering feedback are also introduced.
- **Section 5** This section shows how the methods introduced in previous sections are used to explore the research questions.
- **Section 6** Here the autoethnographic story about using the scifi prototyping method for posthuman design is told.
- **Section 7** This section provides an external perspective on the scifi prototype artefact through focus groups.
- **Section 8** This is the discussions section.
- **Section 9** Conclusions can be found in this section.

2 Theoretical Framework

This section takes a look at literature on the themes of my first research question "How can science fiction prototyping be used for posthuman design?". The themes are: Posthumans, Cyborgs and Cyborgs in science fiction. First I take a look at the concept of posthuman and by extension posthumanity. Then I take a look into how cyborgs can be defined. Lastly I list various depictions of cyborgs in science fiction stories as a reference for the reader on how popular depictions define the cyborg.

2.1 Posthuman

To understand what a posthuman could be a look into posthumanism is needed. As a concept posthumanism can be defined as being an answer to the problems created by humanistic thinking like Lummaa and Rojola (2014, p.13) write and also as an attempt to answer the question of what it means to be human, as Herbrechter (2014, p.76) points out. Just like posthumanism is what come after humanism, posthuman is something that comes after humans. Note that coming after the other in this context does not mean that the two ideas cannot co-exist in the same time-frame, but rather that the latter is an iteration, evolution of the former.

A part of this definition has to be dedicated for noting the difference between posthumanism and transhumanism. Since these two ideas are easily mixed up I emphasize here that this thesis with its cyborg design is a posthumanist, not transhumanist take on the subject. Ferrando (2017) explains the differences well in her video "The main difference between posthumanism and transhumanism" and I paraphrase: Posthumanism is about the deconstruction of the human, about the question of what it means to be human. In posthumanism, the human is not seen as a superior entity compare to others. This is in direct contrast to transhumanism which is about human enhancement, making humans better, above everything else. It is searching for human perfection. Ferrando also points out in her video that for all their differences, these two concepts share the idea of humans as an unfinished entity, an "open notion".

2.2 Cyborg

Cyborgs as a concept are something within posthumanism and the idea of a posthuman, so information regarding them can be found within the same set of literature. Looking into the definition of a cyborg, two dictionary entries are taken shown as a starting point. The Oxford Reference (n.d.) takes a neutral tone and flatly explains them as cybernetic organisms, a hybrid of human and machine. Writing for Encyclopedia Britannica, Craig Heckathorne (2023) tells us that cyborgs are humans with biochemical or electronic modifications. They tag cyborgs as "fictional characters" who are either superhuman with one example, but more importantly they write how cyborgs are depicted as humans who have lost their humanity, referencing fictional characters such as RoboCop and Darth Vader. The focus of this entry is how this dehumanization is something technology inevitably causes and this is in my opinion humanistic thinking, which is problematic. Humanism is a bad starting point for thinking about a posthumanist future with cyborgs as posthumans, like the following quote from Herbrechter alludes to:

"Humanity cannot imagine anything except the worst to come after its projected end." (Herbrechter, 2014, p.76).

Note that the concept of a cyborg is broader than what is depicted here. For example Murata et al. (2019, p.129) list out four categories of human cyborgs with increasingly complex and invasive technological augmentations and in the context of their research the focus is on "cyborgs as people with implantables or insideables that enable them to overcome human capacities.". Alternatively, Warwick (2014, p.264) defines a type of cyborg as a robot with a biological brain as a decision making unit, which obviously does not have a human origin. A very different example would be a virtualized cyborg like what Herbrechter (2014, p.97) describes, an entity existing only in the virtual world, but still classified as a cyborg. The posthuman cyborg in this thesis follows the idea of a hybrid of human and machine, but with a posthumanist approach where humanity, being or having a human-like existence is not a priority.

I would be amiss not to bring "Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century" by Haraway (2016) into spotlight here. How

they position the concept of a cyborg to be the opposite of Western male-centric idealism of how a human should be and act. From identity to sexuality, politics and social framing the text clearly defines a cyborg as something not bound by currently prevailing rules of society. Their writing serves as a reminder that a cyborg can be a posthuman in more than physical ways. Haraways manifesto uses the cyborg concept primarily as a vessel for her posthumanist feminism, but note that I am not actively taking part in that conversation within this thesis.

2.3 Cyborgs in science fiction

Following is a small list of different ways cyborgs are depicted in science fiction. The purpose of the list is to give a quick overview of how the subject is handled in entertainment media, which scifi is inherently a part of, but you are also encouraged to look into the titles listed here if this is your first time reading about cyborgs in general. The list was created through personal assumptions of cultural significance and personal preference and is in no way exhaustive.

Title	Depiction
Ghost in the Shell	Humans with prostheses and ability enhancing augmentations that visually look like normal human counterparts
	A typical augmentation is the ability to connect into a global network (Internet) without an external terminal.
	If a full cyborg, usually still human-like with human proportions in appearance
	Cyborgs very much unlike humans in appearance can be found, for example a literal box with robotic manipulators.
Appleseed	Human-like, but full cyborgs often have extreme body proportions or features
Cyberpunk	Humans with visible cyborg augmentations, only one full cyborg individual exists in the depicted world.
RoboCop	A satire with powerful, but unwieldy cyborg humans like the titular RoboCop.

3 Methodology for Artistic Research

The main research approach of this thesis is artistic research. In this section the methodology is introduced. In addition, the autoethnographic method that is used as the main research tool is described.

3.1 Insight through making art

According to the Vienna Declaration of artistic research (AR), the key features are defined as in the following quote:

”Excellent AR is research through means of high level artistic practice and reflection; it is an epistemic inquiry, directed towards increasing knowledge, insight, understanding and skills. Within this frame, AR is aligned in all aspects with the five main criteria that constitute Research and Development in the Frascati Manual. Through topics and problems stemming from and relevant to artistic practice, AR also addresses key issues of a broader cultural, social and economic significance” (“Vienna Declaration on Artistic Research”, 2020)

In trying to define what artistic research is, I find that it has to include the act of making art and reflecting on the process of making in some way (Gröndahl et al., 2023, in section: ”Taiteellisen tutkimuksen työkaluja”). A more detailed definition of the artistic research process can be found in how Hannula et al. formulate the following recipe:

“...artistic research = artistic process (acts inside the practice) + arguing for a point of view (contextual, interpretive, conceptual, narrative work)” (Hannula et al., 2014, p.15)

The order of operations in research through practice like artistic research matters. Barrett and Bolt (2019, p.6) point to Heidegger’s idea of praxical knowledge, that theory is built through practice and not the other way around. This can be used to explain how artistic research generates insight and why it matters that the act of making comes

first. The act of making art produces unexpected insight into the artistic processes, compared to if research into said processes started with theorizing possible answers.

A note on what type of knowledge artistic research produces. I paraphrase Gröndahl et al. (2023, in section: "Taiteella tutkiminen – mitä se tarkoittaa?") in writing that as a research method it does not produce answers, empirical data or anything associated with traditional research, but instead gives insight into questions, new perspectives and acts as a conversation starter.

3.2 Yourself as the research subject

There is a major problem one has to be aware of when doing artistic research: human bias. Lampela (2017) points out in their article, adjacent to Hannula et al. (2014, p.7), that in artistic research there exists a want and need to "be an artist" and nothing more. Within this idealistic way of doing artistic research, art would be the end of research within the subject, with no extra information needed. The artist would not have to elaborate on decisions they made, or anything else. As amazing as that sounds this approach runs into one problem out of many that should stop anyone from using it: Interpretation, the ability for those who see your research, your art, to interpret it as they see fit. They could do this because it has no explanations, definitions or arguments. At worst it is just an artefact with no context.

3.3 Writing about personal experiences

With the risk of oversimplification, autoethnography is ethnography, but with the researcher as an active participant. Adams et al. define in *Autoethnography*, on page 2, that the method produces stories. These are by design a combination of aesthetic writing and deeply analytic views on the individual writer and the culture around them. Adams et al. look into the history of autoethnography and note that:

”Autoethnography is a research method that uses personal experience (“auto”) to describe and interpret (“graphy”) cultural texts, experiences, beliefs, and practices (“ethno”).” (Adams et al., 2017, p.1)

Locating autoethnography, the main research tool of this thesis on the field of modern autoethnography, I see that analytic and evocative are on the opposite sides of the autoethnography spectrum (Adams et al., 2013, p.64). Kettunen summarizes in their dissertation “Mielekkyyden muotoilu : autoetnografia tuotekehityksen alkuvaiheista”, on page 76, that evocative autoethnography brings to focus the personal learning experience of the writer, whereas analytic autoethnography focuses on cultural analysis.

I am bringing Kettunen’s work into the front here as they are a Finnish designer who used autoethnography to analyze their work in the field of design and this thesis is Finnish design research with similar goals. When writing their dissertation, Kettunen dismissed evocative autoethnography for analytic autoethnography, because at that point in time, and I paraphrase, they did not want to challenge the academic tradition (Kettunen, 2013, p.77). Then, in the same year 2013 on which Kettunen published their dissertation, Anderson, who Kettunen referenced for the rules of analytic autoethnography (Anderson, 2006), commented in *Handbook of autoethnography* (Adams et al., 2013, p.58) that the specific manifest they wrote in 2006 where they set those rules made a mistake in trying to be the definitive standard of academic autoethnography and that it should not be considered valid. From this timeline of events I argue that the rules of autoethnography are fluid and trying to find and adhere to a set of explicit rules could easily result in bad auto-ethnography.

A fresh take, maybe more of a collection of good approaches and things to note for successful autoethnography, comes from Grant (2023) in “Crafting and recognising good enough autoethnographies: a practical guide and checklist”. To summarize the ones relevant to the autoethnography in this thesis:

- Autoethnographic writing should be aesthetic, interesting to read.
- It should contain and preferably attempt to elicit emotions in the reader.

- Reflexivity, the ability to be deeply self-critical, is important as autoethnography is by definition very personal.
- Autoethnography should be written from personal experience.

In addition, on reflexivity Kettunen notes that an autoethnographer has a risk of becoming self-centered, ignoring the real cultural and social influences affecting them that should be the focus of autoethnographic research (Kettunen, 2013, p.74). From the idea that autoethnography should be interesting to read, I make a connection and quote Maanen, an established ethnographer, writing about what everyone involved in research is doing:

”We attempt to convince others that we have discovered something of note, made unusual sense of something, or, in weak form, simply represented something well. This is to say that a good part of our writing is both explicitly and implicitly designed to persuade others that we know what we are talking about and they ought therefore to pay attention to what we are saying.” (Maanen, 2010, p.240)

4 Methodology for Posthuman Design

In this section I introduce the methods used in this thesis to produce the posthuman cyborg design. The functional success of the scifi prototype comic and the cyborg design are evaluated through the method of focus groups, which is also explained here.

4.1 Developing ideas through science fiction

Science fiction prototyping is a method where the goal is to understand consequences of new ideas through fictional stories. Scifi prototyping works by creating these stories in different forms, written, illustrated or even movies that conceptualize future worlds and virtually test ideas in them, finding problems and solutions. Johnson in their book *Science Fiction Prototyping: Designing the Future with Science Fiction* determines the key parts of such a story with the help of science fiction author Doctorow like this:

”New technology exists, technology causes problems to humans, humans solve problems, humans learn from problems caused by technology” (Johnson, 2011, p.51-52). Johnson’s book is practically the only source on the method with Johnson being the originator. This single-source definition is a risk which I acknowledge, the method lacks usage and iteration. In addition usage of scifi prototyping is sparse in the field of design research. An approach called design fiction is much more prevalent when it comes to using fiction as a key part of research.

4.2 Designing for fictional worlds

Design fiction has gained traction especially within the Human Computer Interaction field during the past decade, as seen in Lindley and Coulton’s look into the methodology (2015, p.210). A timeline of where and how design fiction as a concept has come up with during the past decades follows. Bleecker popularized the term with his essay “Design Fiction: A Short Essay on Design, Science, Fact and Fiction”, but I am going to argue that Bleecker got the idea from Sterling who is being noted by Lindley and Coulton (2015, p.210) as the first person who repeatedly used the term in the context of design. Bleecker references Sterling’s work multiple times in his essay of 2009, on pages 6, 29, 68 and 86 for example, but never directly points to Sterling’s definition (2005, p.30). Note that an even earlier use of the specific wording in the context of design is by Alex Milton in 2003 as pointed out by Baumer et al. (2020, p.1902). In regards to scifi prototypes, Johnson (2011, p.11) cites Bleecker as someone thinking about similar things in comparison to scifi prototyping, but in my opinion Johnson does not intent that to mean a scifi prototype is design fiction. At least not as defined by Bleecker (2009, p.83).

Everyone seems to want their own version of the ”research through scifi” definition. To try and define design fiction is to then get confused by the term having multiple slightly different meanings with different components depending on who you ask. Lindley and Coulton, citing an interview with Sterling (Bosch, 2012) have come up with the following definition:

”So a design fiction is (1) something that creates a story world, (2) has something being prototyped within that story world, (3) does so in order to create a discursive space.” (Lindley & Coulton, 2015, p.210)

Comparing that with the idea of a scifi prototype brings forth similarities. I think a connection to scifi prototyping can be made here without just combining the two: design fiction is not scifi prototyping, but scifi prototyping is design fiction. There also exist methods with similar influences, arguments and outcomes, like speculative design and even critical design. Speculative design for example is mentioned by Lindley and Coulton (2015, p.210) as being adjacent to design fiction, with similar goals. I mention those two methodologies here without further detail to note that in my opinion speculative design, critical design and scifi prototyping have enough similarities to at least partly fit inside design fiction with the unifying theme being ”creating discourse through fiction”. See Figure 1 on this page for a simple visualization.

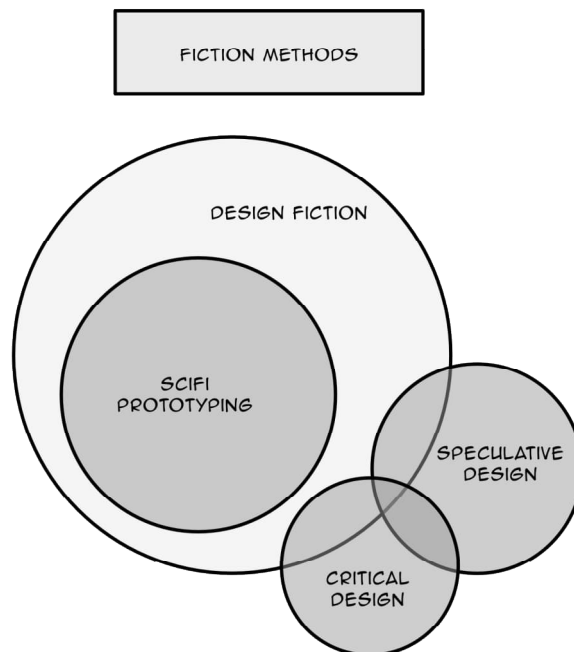


Figure 1: Venn diagram visualizing relationships of mentioned methods or methodologies

4.3 Validation through external discussions

Focus group interviews are used to get feedback on a subject in a more free form way compared to, for example, one-to-one interviews. When conducting a focus group, the researcher goes into it looking for a discussion between people who are knowledgeable in the subject and through that discussion the researcher gets a relaxed, natural collection of data. Even with the inherent freedom of the conversations, Morgan writes that:

”Rather than attempting to observe behavior as it naturally occurs, focus groups create concentrated conversations that might never occur in the ”real world”.” (Morgan, 1997, p.31)

Focus groups can be used for validation of an idea specifically because they do not include the researcher in the discussion, which then brings to front the groups own perspectives (Morgan & Spanish, 1984, as cited in Acocella, 2012, p.1126). Focus groups are a good way to gather large amounts of information of a unique or novel subject in a comparatively short amount of time (Bertrand et.al, 1992, as cited in Acocella, 2012, p.1126). Acocella also points out multiple things to look out for when selecting focus group participants, but one very relevant to this thesis is that ”it is important that the people involved are interested in the topic and that they are able to discuss it thoroughly in the little time available.” (Acocella, 2012, p.1127).

Also of note is that a definitive way to conduct focus groups does not exist. Instead the validity of such studies comes from transparency on how the focus groups are held and what and why specific choices were made (Hennink & Leavy, 2014, p.96).

5 Designing a Posthuman Cyborg

In this section I expand on how the methods introduced earlier are used in this thesis in order to make posthuman design. The main framework of this thesis is artistic research. Making art, or in this case design, is how this thesis creates new knowledge. Through the artistic process I create a scifi prototype in the form of a comic. As artistic research is interested in what happens inside the act of making, the process of creating that scifi prototype comic is documented by me into a diary. This diary is then deconstructed and analyzed through an autoethnographic story. Focus groups are brought in outside of artistic research and used as a validation tool of the scifi prototype comic and as an external perspective in the autoethnographic story. This notion of something external to artistic research is due to art artefacts not requiring anything but themselves to be art, but a design artefact is deemed to inherently need external validation for it to function as design. For clarity the relationship of these research components are visualized in Figure 2.

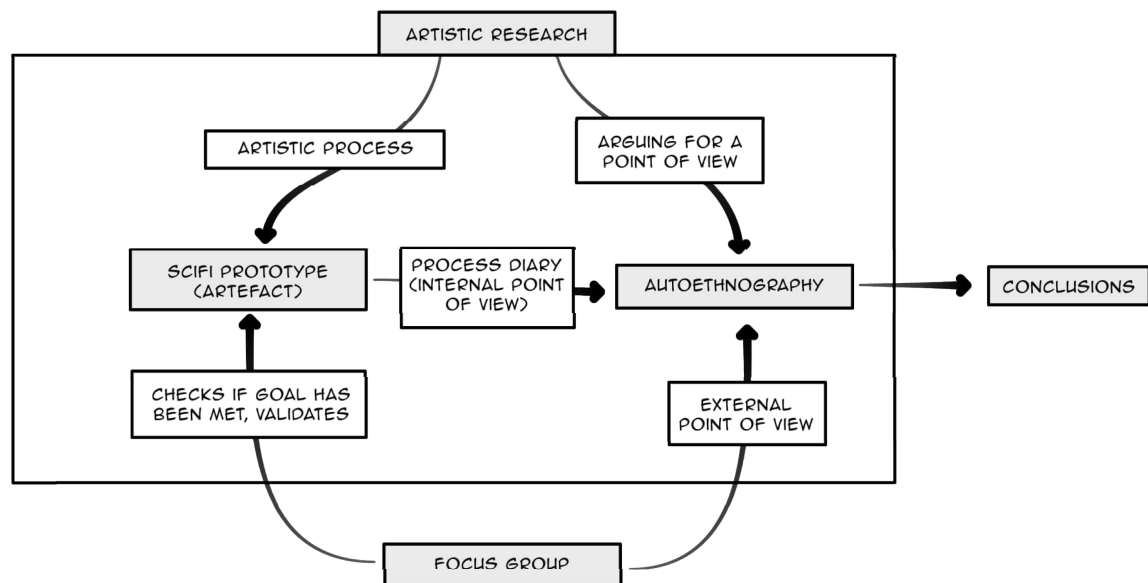


Figure 2: Diagram on how components of the research are related to each other in this thesis

5.1 Artistic research for design

This thesis uses artistic research to explore a novel method to do future-oriented design. As clarification, in my opinion design is not art and art is not design, but within both exist many similar concepts when it comes to the process of making. I will not go into detail on these similarities, but note that because of them I sometimes use the word "art" and sometimes "design" when either could be valid.

In my opinion a clear difference does exist though. My position is that art is art. It does not have to be observed in a specific way, nor does it have to be made for a specific audience. Design on the other hand becomes design only after it gets associated with a function. Design has to answer a question, to solve a problem, to be functional. Designers do not just imagine a thing, "we design both a thing and its use" (Redström, 2017, p.78). In the case of the design artefact in this thesis, the scifi prototype comic, it has to be able to communicate the design of a posthuman cyborg. As far as I can search the methodology of "design process research" does not exist yet, but how artistic research is done and what knowledge it can produce are exactly the same as what I think design process research should have. We just have to be mindful of those additional requirements on why design is design. See Figure 3 for a visualization of this.

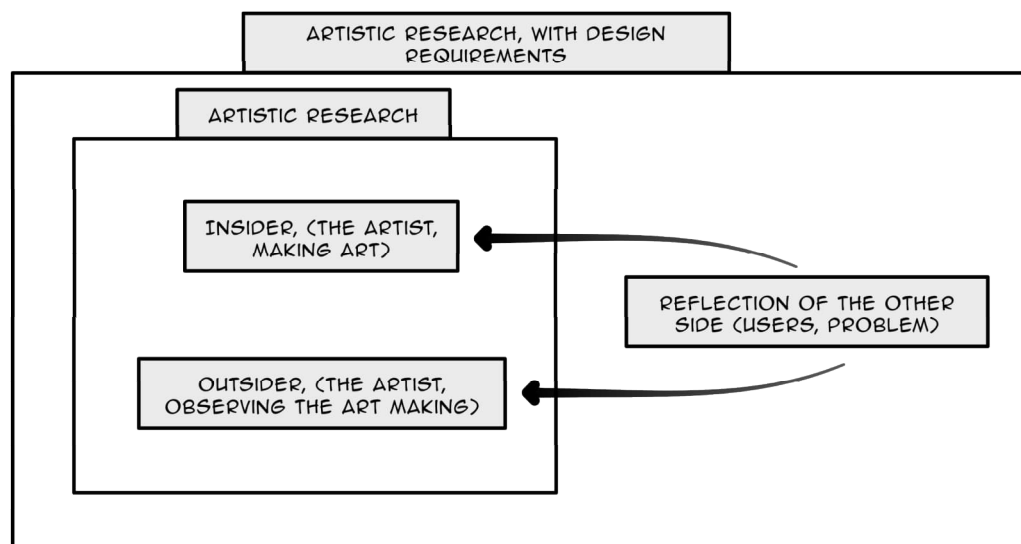


Figure 3: Diagram visualizing how design as the subject affects artistic research

The goal of a design process is an artefact of some sort, be it a product, concept or something else. In the case of this thesis, the end result is a story depicting the world and designs of posthuman humans. If one was to write about the design with nothing visual added, chances are that someone reading that description would form a very different image of the thing depicted in their head than what the writer intended. A quote from Hannula et al. notes that:

”When, for instance, something visual is transposed into written language, we get a reinterpretation, a description, an enactment, but not the thing itself, if for no other reason then because by writing down or reading we are already changing our experience, moving into a new situation.”
(Hannula et al., 2014, p.27)

A design would be difficult to convey through writing alone, but a design process is difficult to explain or analyze through nothing but pictures. My design process works through tools like sketches, references and 3D models. By writing about the decisions and thoughts I have through milestones I pass within the process I attempt to provide context and transparency. From the writing one can understand, analyze and criticize the process. Providing transparency of how the process was executed makes critiquing the research possible even when the results, the design, consist only of visual material. This is key to successful artistic research (Hannula et al., 2014, p.26).

5.2 Scifi prototyping as design method

Using scifi prototyping as a method, there is a difference between how Johnson (2011) is instructing us to use it and how I used it in this thesis. The way described by Johnson would begin with an idea, for example a piece of technology, before it is introduced to the real world as a product, and evaluate that idea through the science fiction prototype. Then that prototype, whatever form of story it takes, would attempt to function as an expansion on the original idea or research, an explanation of sorts where the idea is put through a fictional, simulated world and it would be possible to

see what happens with the idea in that world, through the story.

In my iteration of Johnson's scifi prototype method, I work on the idea, the posthuman cyborg design, within the process of making the scifi prototype. The process starts with creating a world for the story, not with the idea like in Johnson's version. The design goes through a feedback loop when the world that I imagine and iterate on opens up challenges unsolved by the design, or when I see that I have to expand on the details of the design for it to be more easily interpreted through the comic. This iteration is not visible in the final prototype comic, which can be seen in Appendix A, but it becomes very apparent through the autoethnographic process analysis. The main difference in approach between my and Johnson's scifi prototype is that an idea would remain unchanged in Johnson's version even if through the lens of the story it could be seen that the idea within had problems in it. With this modification I position scifi prototyping as a tool to make posthuman design with.

5.3 A more personal view on autoethnography

In this thesis I analyze the actions and thoughts of me as an individual designer through autoethnography. To achieve this I kept a diary during the process of making the posthuman cyborg design and the scifi prototype comic, which can be found in Appendix B. Focus groups were held as a part of the research, but as shown in Figure 2 on page 17 these groups were an outside validation of the scifi prototype comic and affect the autoethnographic analysis in a way that can be best described as external commentary. While there is no doubt about the influence of others and the surrounding culture on me as a designer, the thoughts and actions being analyzed here are those of my own.

Autoethnography is about understanding culture through personal experiences, as Adams et al. (2017, p.1) describe. Everything I do within the design process is in one way or another tied to my personal culture, shaped through my social environment and my understanding of local and global cultural values. The autoethnography in this thesis does not just include the researcher as key subject, but is solely focused on them.

5.4 Validating the design

In this thesis focus groups were used to validate the scifi prototype. The validation gave an external point of view on if the prototype was successful in communicating a believable posthuman cyborg design. As a discursive data gathering method, it gave me critique, feedback and thoughts through conversations about the prototype comic. The data gathered expands the autoethnography in this thesis by adding outside perspective to the scifi prototype, but its main usage is evaluation and validation.

The focus groups were set up so that the participants and the moderator were in a room in-person, with me as the note taker through a video call. The participants were asked to consent on paper to the discussions being recorded, which they all did. The focus group participants were in total six design students and their participation was part of a course they were attending. There was no specific selection process, but a preference was given to include exchange students in the groups if possible. Two focus group sessions were held, with different sets of participants, three individuals per group. One group was held in Finnish, the other in English. The duration of both discussions was about 30 minutes each.

The participants were asked three key questions positioned as conversation subjects. All three key questions had two probing questions that would be used if the conversation stopped too short or at the discretion of the moderator. A set of opening and closing questions were also included in the plan.

The discussion plan can be found in Appendix C.

6 Story of a Design Process

In this part an autoethnographic story about how I used scifi prototyping to design a posthuman cyborg is told. This story is written about half a year after I finished the prototype comic and is based on a diary I kept while making the prototype. The diary can be found in Appendix B. The story is told through themed sections, and the events do not necessarily happen within a linear timeline. The overall timeline starts when I begin the process of designing the posthuman cyborg and ends when I submit the comic to a printing service just before an art exhibition held between 26.09.2023 and 6.10.2023 where I showcased the comic at the University of Lapland.

6.1 The concept of a posthuman

How can a human design a posthuman? One answer to this is that a human cannot even imagine a posthuman as, perhaps in a mocking tone, a human is not in fact posthuman. I chose to ignore that criticism as all it did was sound like a challenge to me and thus began that very process of designing one. Crippling self-doubt struck immediately, as is the norm when doing anything creative, but pushing past that I thought "Let's give it some context: What does the world of the future look like for a posthuman? What is plausible, but still far away?" The answer came in the form of something obvious due to its increasing presence in media, but also through a sense of fascination and a heavy, personal, fear. The world, the place my posthuman would inhabit? Ocean. A future ocean, where humans have been forced to admit the ones looking for infinite growth were the problem and stopgap solutions were not enough. An almost alien environment where humans can't live at the best of times, the ocean of the future was the perfect environment for a posthuman. That posthuman would have to be something other than human, something very different.

This was just the starting point, which at the time I did not fully realize. The world was an ocean, and it needed a posthuman, a cyborg posthuman. I mean, it needed one because I decided that, but it would be a boring cyborg design project without a cyborg. So I went and designed a crab-person, a dolphin-person and an octopus-person.

If that sounds too on the nose, well, it was. No creative posthuman crescendo here, just a droning, foreshadowing sound of "well, you made a human who's wearing an animalistic exoskeleton. How human of you". I chose the human-octopus and went on to try and better understand these cyborgs and the world they live in.

What was it? What could a human not do? Understand a posthuman, that's what. In defiance of people who understand the meaning of words, I thought about what makes one posthuman? Are you, human, post enough after every part in your body is replaced by an equivalent created through technology? Does one have to undergo a complete overhaul, even to the point they lose their personality, their memories? Do you have to be born as one and where does that line exist? Can a human become posthuman, or is a posthuman something that can't originate from a human?

What are memories? Where in a human do they exist and can they be carried over if one becomes posthuman?

Would a human mind, synapses and all, understand if the vessel the mind resides in had tentacles instead of hands? Could it learn how to use them instead of hands?

Perfectly normal questions, not at all existential crisis inducing.

I sat in front my screen, pondering about details like "do we need the brain and the spine to be intact?", and then catching myself telling myself aloud that "this is getting out of hand, you need to make it good enough for you to be happy with it" a paradox if there ever was one. On that very same day I decided to re-design the cyborg. It was too human, not "post" enough. Good enough was not good enough and practicality made way for honesty to myself. It took a day to change the design, but I was happy. The cyborg became something no one could mistake for a human, even an augmented one. A hybrid of shark, manta-ray and octopus. Obvious inspirations, but still something new. Something a human would look at and say that it looked frightening, as some focus group participants put it when I presented the comic to them with this very design in it. Fear is a natural reaction to something unknown. The fu-

ture is a great unknown, but we can imagine and converse about possibilities, which in turn might affect our future through action inferred from those conversations and ideas.

6.2 Scifi stands for imagination

Making ones work be about fiction, rather than fact, introduces a sense of freedom to it. Requiring imagination in order to enjoy fiction is implied, so no one can point to your work of fiction and say it has to be factual. It has the word "science" in it, so there has to be a balance, but I can't point to an existing cyborg and say "that's what mine looks like", I have to imagine it and communicate it to you in a way that makes you understand. Still, even fiction has a frame of rules around it, even in fiction a stereotypical story is about the rise, fall and another rise of a hero, conquering their own shortcomings and becoming better. As someone who felt like my academic position was not one where I could break rules imposed by large groups of people, I wanted to make my cyborg design through creating a scifi prototype like Brian Johnson instructs in his book "Science Fiction Prototyping". There were rules, all was good.

Nothing was good.

This caused a number of sessions where I doubted myself, the guidelines Johnson lays out in his book and what I knew of design as a process. In hindsight, trying to do research through methods developed for different fields than what you yourself are researching should always carry with it an ability to admit when something is not working for you and your subject. The thing about Johnson's version of science fiction prototyping is that it is ostensibly a tool for evaluation. This is not dissimilar to how "design" uses prototypes, but there is a huge difference, a limitation in how he himself uses it and advises others to use it.

This next part feels like a picture would illustrate my problem better, but let's have a go anyway: Johnson's scifi prototyping, which I really wanted to follow and work with to make the cyborg, is usually applied to an idea after the idea is done. Then the prototype is given to the people who made the idea, they look through it and maybe get

some feedback from it, a better understanding of how their idea could work in a future world. In Johnson's version, the idea being prototyped does not get changed inside the prototype and this caused problems for me. How does a design method work if one cannot iterate on the design while using it? This made no sense, but rules are rules. Right?

I went back and forth with myself, asking if I should stop iterating on the design when the world I created inside the prototype begged for iteration for the cyborg to feel plausible, real. I wanted to believe that a solution would emerge, but more problems surfaced as I struggled with myself. One of these problems was, once again, humanism. Human centered thinking, humans first. This came in the form of Johnson's guidelines calling for "human inflection" and something like "ramifications of the idea being prototyped".

So I changed the rules.

I was not interested in humans. Quite frankly, my starting point in the prototype was that humans, the humanistic thinking, the more is more and growth is infinite thinking was the problem that caused the ocean and the whole planet Earth to get worse. Worse for everyone. The cyborg, while being posthuman and designed in many ways to be an intervention, a posthuman solution to human-made problems, carries with it a symbolic value of, for a lack of a better word, repentance, humbling of the human. It is my critique of how we do design and how design is seen. Some of the focus group participants reading the comic touched on this when saying the life of the cyborgs was harsh and not fun at all. The cyborg I designed is supposed to be this technological marvel, a way to change a human to something very much not, at the same time a better creature while simultaneously something you cannot compare to humans. Yet, their lives are mundane, even simple. It's a conscious decision.

Talking about biases, here's one of mine you might have guessed at this point: I have a hatred towards western humanism, late stage capitalism, marketing speeches, any "innovation" that promises a better world at no cost to you or yours. This hatred seeps through everything I do, in good and bad, and it is embedded into the scifi prototype I made. This hatred also made it impossible for me to take the words of Julian Bleecker

or Brian Johnson, to name a few, at face value.

6.3 Be aware of your own propaganda

Manipulation. Is it a good word? Does that word have good intentions behind it? Depends on the context right? Put it into the context of a story, can a story be used to manipulate people? The human tendency to fear the unknown combined with the yearning of things going well, being happy. These are powerful emotional responses that can and do affect the decision making of most, if not all humans. At one point of the process I found myself with a nagging feeling that something was off with the story in the scifi prototype. It was like Johnson instructed, like other literature concerning this greater idea of "design fiction" instructed.

It had drama in it. I hated it.

An over-exaggeration maybe, drama has its place and can be used to make things interesting. But here I found myself asking, from myself, maybe in front of a mirror: was the dramatic story turn I had in my prototype serving a more sinister purpose? Is the point of drama, the tugging of heartstrings, to in some way manipulate the emotions of the one experiencing a story? I came to the conclusion that yes, indeed it was, and I hated it. I felt that it was a very American way of telling stories, apologies to American story-tellers. Better description would be that it was a Hollywood-type of way of adding drama. Something that almost feels like it does not think the recipients are smart enough to digest anything without added emotions in it. Documentary films full of dramatic sound effects, sense of urgency, action, all while filming a seal resting in the sun, blissfully ignorant and happy to just exist. An explosion is surely needed, to drive the blissfulness home.

I decided that it was wrong. My design of all things did not benefit from drama. There was no point in making things go bad in the story, only for the cyborgs to prevail. There were no dramatic ramifications from becoming a cyborg, just a life that was not any easier than the human one. It became, at least in my head, a documentary that could

be narrated by the likes of Sir Attenborough. A view into the life of a posthuman cyborg, observed from outside, through the lens of a human no less.

As a human cannot understand a posthuman, they must only observe.

6.4 All things end

Any process takes time. That time is very hard to preemptively gauge, so we usually split the process into ever smaller parts and try to think that the time a process takes is then somehow easier to deduce. There are variables that make these "educated guesses" more or less accurate, like how easy a task is to quantify, or how many times you have done a specific task and thus learned how much time it takes to do it.

The creative process is not easy to quantify on the best of days. Then, as if to spite you for thinking you are in control of time, most creative processes have unique starting points and likewise unique results so there's no learning here, no reliably repeating data-points to make averages out of. Thus, planning for a creative project to take a set amount of time is a balance between quality, mental and physical health and being able to finish. It will still fail, you won't be happy with it, but maybe you can take solace in it being finally, actually, done.

That's how I felt when I sent the prototype comic to the printing company, at least partly as there was an exhibition I had to set up the next day. After I sent the files, I got a call from my doctor. I had not been feeling well for maybe a month, couldn't work, could not get out of bed for extended amounts of time. The comic had been a struggle to finish.

I had pneumonia and an anomaly between my lungs. Then an infection in my intestines. Nothing good was predicted from these findings.

So, at the same point when quite literally the longest personal creative project I've ever made was done, I had to give room for thoughts that I, personally could also be done soon. I think I came to terms with the idea of myself dying relatively quickly.

I am here writing this right? With a bit of a thematic stretch, just like the guess when trying to estimate the time a creative project takes is often wrong, so were the initial, life-ending diagnoses of the doctors. I can't digest gluten any longer, that's a long term effect of all the things that were wrong with me, but compared to the initial diagnoses I got off better than anyone could imagine.

Here's to hoping cyborgs like mine become possible soon.

As endings to stories go, what I am trying to say here is that making design through scifi prototyping is hard, takes time, might even try to kill you. Plan accordingly and double the time you think it will take.

7 Results of the Focus groups

This section looks at the results analyzed from the focus groups. The focus groups were brought in as a design evaluation tool outside artistic research as referenced in Figure 2 on page 17 and thus the results from the focus groups are here, separated from the artistic research discussion and conclusions. The focus groups produced data and results of a different type to artistic research outcomes where it makes sense to treat them as their own section. The results are more factual, compared to artistic research which produced discussion and insight into the design process with no definitive results.

There was a discussion plan given to the moderator, which we checked together before the focus groups were held. In both groups the moderator asked either wrong questions, or changed the intent behind the questions slightly. The moderator also disclosed information during the discussion to one of the groups that influenced their understanding of the comic. This behavior likely affected the direction and results of the discussions in both groups. Analysis was possible, but the variations created by the moderators actions made the datasets difficult to compare and unreliable.

The analysis resulted in the following narratives categorized by themes created by combining the questions with the discussion contents:

- The world feels familiar, but the cyborg is out of place
 - After being asked about the world in the prototype, the discussion in both groups agreed that the depiction was a believable future in the context of today's world. To quote "For sure in the way the world is going today"
 - The cyborg was misunderstood as a technologically enhanced animal. If not an animal, a robot would have been more believable than the cyborg being a posthuman human. This was due to the life and tasks of the cyborgs as they were seen too simple for humans or, like one participant put it "I think they are doing the thing that human don't want to do."

- The cyborg is lonely and scary
 - Both focus groups saw the life of the cyborg as a lonely existence, doing menial tasks. Both discussions seemed to navigate towards the cyborgs living an inhumane life in some way.
 - The concept of what a cyborg is was also not clear to most. The cyborg was seen as scary to humans, even a threat.
 - The discussions compared the life of the cyborg living in the far future with the life of a human living today. A quote from one participant, about the life of the cyborg: "Could be better if it was not so monotone. I also don't know if they get paid or anything like it."
- Is the prototype immersive?
 - The prototype was perceived as believable in both groups, but not because of the cyborg. Both groups agreed that the world seemed real, but the cyborgs existence was contested as being, like one participant said, "over-engineered", and the groups would rather see them as enhanced animals or robots with artificial intelligence.
 - The problem of immersion, acceptance of the cyborgs existence, seemed to stem from the shape, life and tasks the cyborgs had, which were seen as non-human, not something a human would do, below humans. To quote one participant: "And for some reason I would see them in a different level like normal human and then those guys somehow they wouldn't be on the same line, I don't know why."

The focus groups with all their shortcomings provided valuable evaluation of the scifi prototype. To summarize, even when the world and the cyborg were accepted as realistic and believable when viewed separately, the cyborg itself was misunderstood as something other than posthuman and seen as excessive compared to what their perceived role was in the world of the prototype. A need was seen for more detail about the world, why the cyborg was a solution to perceived problems and what happened to other life on Earth. Assumptions of the world outside of the ocean can be deduced

from the discussions, which might have affected the perception of the cyborg. The design of the cyborg being seen as scary also warranted feedback to explain the chosen look.

8 Discussion

In this thesis I have explored how scifi prototyping can be used for posthuman design and what requirements it must fulfill to be successful. Previous research specifically like this has not been done or I have not been able to find it.

8.1 Scifi prototypes can be designed with

I found out that scifi prototyping can be used for posthuman design if modified in a way that allows iterative design inside the scifi prototyping process. In comparison to the original version by Johnson (2011), this iterative version allows for the idea being prototyped to change within the prototyping process. Care must be taken with immersive qualities of the prototype and that there is sufficient amount of detail in the worldbuilding and design to minimize interpretation and maximize immersion.

One must be cautious with how the scifi prototype communicates its ideas, as biased manipulative patterns can easily be included in fictional stories, for example by writing dramatic situations, likable characters or emotional events with specific intent. These choices, for example writing human technological augmentation as only a positive thing, can affect the interpretation of the design in ways that ignore the negative or positive aspects of the design in lieu of the manipulative bias in the writing. This bias calls for reflexivity too, as it can affect the design just as well as the story. This is why in the autoethnography in this thesis you can read about my struggles with needing to add drama, like was implied in Johnson (2011)'s guidelines. In my opinion opting for a more documentary-style story made the prototype more balanced in terms of emotional charge, even when I was personally biased towards cyborgs being a good direction for humanity to take.

Lack of prior knowledge of the subject of posthumanity can be observed affecting the focus group discussions made during this thesis. Scifi prototyping as a design method for posthuman design does not work if the one experiencing the prototype does not have sufficient prior knowledge of the subject. Without knowledge on the subject

the one experiencing the prototype will find it challenging to be immersed in it, thus making the prototype hard to understand. If there is a need to publish a scifi prototype of posthuman design to a wider audience with no or little prior knowledge of the subject, additional resources must be allocated into developing detailed exposition of the concept of posthumanity that can then serve as the introduction to the prototype story. This exposition should also be extended into the specific subject being designed. I wrote about scifi prototypes and design fiction in 4.2 on 14 and a similar need for sufficient exposition can also be seen within design fiction with the concept of story worlds.

In my opinion a good scifi prototype for posthuman design includes a design and a world which can be perceived as realistic possibilities by the observer. Additionally there is an immersive quality to a good scifi prototype where one can imagine an existence with the design, within the world.

8.2 Focus groups are challenging

With design process research, focus groups can be extremely valuable as validation tools for the design process outcome. This is because the focus groups provide external insight into the design artefact. As I argued in section 5.1 on page 18, for design to be valid it needs to be functional. Focus group participants experience the design through a successful scifi prototype and through that experience validate whether the design is functional. My experience here shows that if focus groups are used to validate the design in a scifi prototype, rigorous planning, vetted selection of participants and coaching of the moderator are key to useful data. This is not unlike any other focus group-based research, but I want to emphasize the importance in the context of this research.

Using focus groups was suggested to me by my supervisor as possible additional material to my research. A course at the University of Lapland had them as its theme, so it was a good opportunity. The participants were selected randomly and there was no way for me to affect how much prior knowledge of the subject of posthumanity they had. The time for planning was also very limited. Even with these limiting variables I saw it as a beneficial addition.

With the focus groups in this thesis some of the questions in the discussion plan were too vague. For example one of the closing questions, "What do you think about the overall believability of the whole thing?", would have benefited from additional probing questions about the believability of the cyborg. When asked this question, the groups only discussed about the world in the prototype, the future ocean, and ignored the believability of the cyborg completely. The focus group participants were mostly not knowledgeable of the subject matter, which can be seen in the directions the discussions took and how most of the participants did not understand the cyborgs or posthumanity as a concept. The data also corroborates this. Due to this lack of knowledge the focus groups in this thesis produced data that cannot be reliably used to validate the design in the scifi prototype. A technically functional analysis was possible, but it is not based on reliable data.

8.3 Personal experiences through autoethnography

In my opinion the rules are not set in stone when it comes to what is good, academic autoethnography. This is how it should remain. Autoethnographic writing thrives when it is done as a polar opposite to traditional academic writing, which brings with it its own challenges. To make your autoethnography aesthetically pleasing, you have to understand how to write interesting text, which academic writing avoids as a rule. To make it evocative, to include emotion in your writing, you have to embrace subjectivity. Partly due to this subjectivity, autoethnography feels well suited to be used with artistic research, as both are focused more on the researcher-artists subjective experiences and reflexivity than anything else. When making autoethnography one should be keenly aware of the "auto" part as it is easy to be swept into writing without being aware of yourself. Being good at the auto part of autoethnography requires diligent transparency with influences, opinions and everything personal. That you are as critical, thorough and open with yourself as you would be when researching something from the outside, as a spectator.

Through autoethnography I found that designing with scifi prototyping will consume more time and resources compared to a more conventional design process which I use in my current job as an industrial designer. Using the method requires the designer to have knowledge in fields related to storytelling, visualizing for stories and broader than traditionally understood knowledge about technological, environmental, social and other things related to their design subject. A level of critical thinking unlike that required of a typical industrial design job of today is also needed, as a typical assignment is usually only focused on cost-efficiency of manufacturing and aesthetics rather than long-term implications and societal impact of the design.

Writing the process diary I made sure to include frustrations, moments of discovery, self-doubt, joy. Then reading and analyzing for the autoethnographic story made me see again the process, the thought put into it and the multiple paths I had to try. Without evocative autoethnography the personal side of the creative process would not have been possible to show.

A positive discovery with the focus groups and the autoethnography was how I noticed that some of the questions and thoughts I had during the process were reflected by the focus group participants when discussing about the posthuman design. For example when the design was deemed scary, as seen in 6.1 on page 22. It affirmed to me that I made the posthuman cyborg different enough from a normal human, that at least that part of my design was successful.

8.4 Limitations

The results of this research cannot show what is sufficient detail in the worldbuilding or the posthuman design made through scifi prototyping as each case is unique in its requirements. There exists also a major subjective quality to the scifi prototypes due to them being creative fiction. In my opinion these are inherent limitations in any creative work and do not affect the application of scifi prototyping to posthuman design, one just cannot look at the scifi prototype comic in this thesis as a template to new scifi prototypes.

The focus groups held as part of this research lack proper size of the datasets as there were only two groups held. Additionally, because the focus groups were held with mistakenly varying discussion plans and questions the data they provide cannot be fully utilized. The focus groups are also applicable only on the specific subject of posthuman cyborg design. This is unfortunate, but does not affect the application of scifi prototyping to posthuman design.

8.5 Personal notes

As the one who made the discussion plan for the moderator, I am responsible for not having a more in-depth conversation with them about how the focus groups should be moderated. Emphasizing that the questions and probes should stay the same between focus groups could have prevented the themes of the discussions from becoming too dissimilar. I chose not to intervene during the discussions as comments from me could have changed the discussion even further.

Design literature references in this thesis seem to ignore design as an act of planning and creation and instead see it as something inherently materialistic and consumerist. They define it as such and say that it is a bad way to design and that their own versions of design as a process are better. I personally found this irritating, how design was automatically seen as something providing more material value to things. When people like Bleecker, who is cited as one of the originators of design fiction, position their own approach to design as something better, above materialism, consumerism, corporate goals, I argue that the better version was already there and they invented nothing new, just circled back to the basics of design as an act. Then they try to sell their version as a novel, pure version of design, to companies attempting to clean their materialistic brand value. I understand that today the word "design", associated with design items, products and other such things has its popular cultural meaning deep in materialism, giving monetary value to products, but to me it feels like this is an intentional hijacking of the term by profit-seekers and should be fought back, at least in education. As I see it, financial benefit is a side-product of good design.

The methods and subject matter in this thesis were admittedly difficult to manage, especially with limited time in a week working my day job five days a week. Then factor in the health problems that persisted through these five or so years and I am amazed I got through.

9 Conclusions

The research questions this thesis explored were "How can science fiction prototyping be used for posthuman design?", followed by "What are the requirements for a successful scifi prototype design?". The core subject of this thesis, researching a possible method for posthuman design, was selected for its uniqueness in the field of design research, increasing interest in the subject in the field of design and the personal interest of the researcher.

Through artistic research I wanted to explore a novel way to design for a posthuman future. I selected scifi prototyping as the method to design with as it was a tool for future research where one builds a world for a story in which an idea can be tested in. The idea in my case being a posthuman cyborg design. During the design process, I held a diary, from which I wrote an autoethnography which served as the main research tool of the thesis.

The autoethnography analyses the whole process from a personal perspective. During the artistic research process I found out that the scifi prototyping method had to be altered for it to function as a design method. The original intent of it was a tool to evaluate an idea rather than designing an idea. By removing the limitation of the "idea" remaining static within the process of making the prototype, the method was changed to a tool of iterative design. After this alteration I iterated on the design, the world and the story until I had a posthuman cyborg design I was satisfied with. In writing the story for the prototype, I found out that including emotionally biased patterns in the story should be avoided as this can easily manipulate the ones experiencing the story into viewing the prototype in a specific way.

The scifi prototype took the form of a short comic and this comic was shown to focus groups as a way to validate the design and the prototype. From the focus groups I found out that the scifi prototype must have sufficient exposition and detail in it for it to become immersive and understandable. The amount of exposition is dependent on the subject and prior subject knowledge of the ones experiencing the prototype.

Using the modified scifi prototyping method requires from the designer a critical view of their design process and extensive knowledge on subjects around their design.

The resulting method if combined with autoethnographic analysis of the process is a novel method for posthuman design that can be situated within the field of design fiction. This research fills a gap in the knowledge on how design for posthumans is made, which was the goal of the thesis.

Additional research should focus on usage and iteration of the modified scifi prototype method in posthuman design. Even when the results of such prototypes are stories, which can be highly subjective experiences, a set of guidelines on what one should focus on in terms of worldbuilding, detail, story and media format can in my opinion be constructed by repetition, iteration and validation through similar research. My notes on how a scifi prototype can be manipulative to its detriment can and should also be further studied in my opinion, but researching this subject should be a joint effort with communication studies and design research.

References

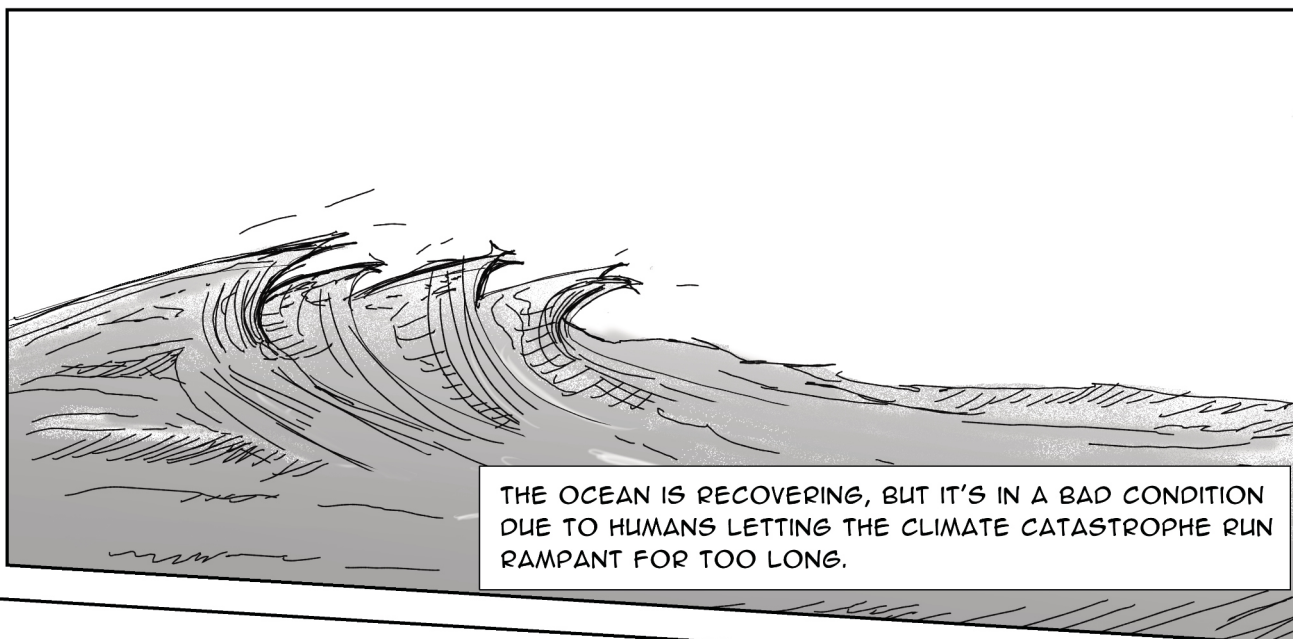
- Acocella, I. (2012). The focus groups in social research: Advantages and disadvantages. *Quality & Quantity*, 46(4), 1125–1136. <https://doi.org/10.1007/s11135-011-9600-4>
- Adams, T. E., Holman, J. S., & Ellis, C. (Eds.). (2013). *Handbook of autoethnography*. Taylor & Francis Group.
- Adams, T. E., Holman, J. S., & Ellis, C. (2014). *Autoethnography*. Oxford University Press, Incorporated.
- Adams, T. E., Ellis, C., & Jones, S. H. (2017). Autoethnography. In *The international encyclopedia of communication research methods* (pp. 1–11). John Wiley & Sons, Ltd. <https://doi.org/https://doi.org/10.1002/9781118901731.iecrm0011>
- Anderson, L. (2006). Analytic autoethnography. *Journal of Contemporary Ethnography*, 35(4), 373–395.
- Barrett, e., Estelle, & Bolt, e., Barbara (Professor of art) (Eds.). (2019). *Practice as research : Approaches to creative arts enquiry* (First edition). I.B. Tauris & Co Ltd. https://luc.finna.fi/Record/luc-electronic_yo.994794754206246
- Baumer, E. P. S., Blythe, M., & Tanenbaum, T. J. (2020). Evaluating design fiction: The right tool for the job. *Proceedings of the 2020 ACM Designing Interactive Systems Conference*, 1901–1913. <https://doi.org/10.1145/3357236.3395464>
- Bleecker, J. (2009). *Design fiction: A short essay on design, science, fact and fiction*.
- Bosch, T. (2012). *Sci-fi writer bruce sterling explains the intriguing new concept of design fiction*. Retrieved March 27, 2024, from <https://slate.com/technology/2012/03/bruce-sterling-on-design-fictions.html>

- Ferrando, F. (2017). *The main difference between posthumanism and transhumanism - dr. ferrando (nyu), concept n. 2*. Retrieved December 8, 2017, from <https://www.youtube.com/watch?v=l2J5EiB3vrA>
- Grant, A. J. (2023). Crafting and recognising good enough autoethnographies: A practical guide and checklist. *Mental Health and Social Inclusion*, 27(3), 196–209. <https://doi.org/10.1108/MHSI-01-2023-0009>
- Gröndahl, L., Arlander, A., Järvinen, H., Kumpulainen, S., Porkola, P., Rouhiainen, L., & Bredenberg, M. (2023). *Taiteellinen tutkimus*. Taideyliopiston Teatterikorkeakoulu. https://luc.finna.fi/ulapland/Record/luc_electronic_yo.994893754306246
- Hannula, M., Suoranta, J., & Vadén, T. (2014). *Artistic research methodology*. Peter Lang.
- Haraway, D. J. (2016). Cyborg manifesto: Science, technology, and socialist-feminism in the late twentieth century. In *Manifestly haraway*. University of Minnesota Press. <https://doi.org/10.5749/minnesota/9780816650477.003.0001>
- Heckathorne, C. (2023, September 20). *Cyborg*. Retrieved February 14, 2023, from <https://www.britannica.com/topic/cyborg>
- Hennink, M. M., & Leavy, P. (2014). *Focus group discussions*.
- Herbrechter, S. (2014). *Posthumanism: A critical analysis*. Bloomsbury Academic.
- Johnson, B. (2011). *Science fiction prototyping: Designing the future with science fiction*. Morgan & Claypool Publishers. <https://books.google.fi/books?id=VY9hAQAAQBAJ>
- Kettunen, I. (2013). *Mielekkyyden muotoilu : Autoetnografia tuotekehityksen alkuvaiheista* [Doctoral dissertation, Väitöskirja :]. Aatepaja.

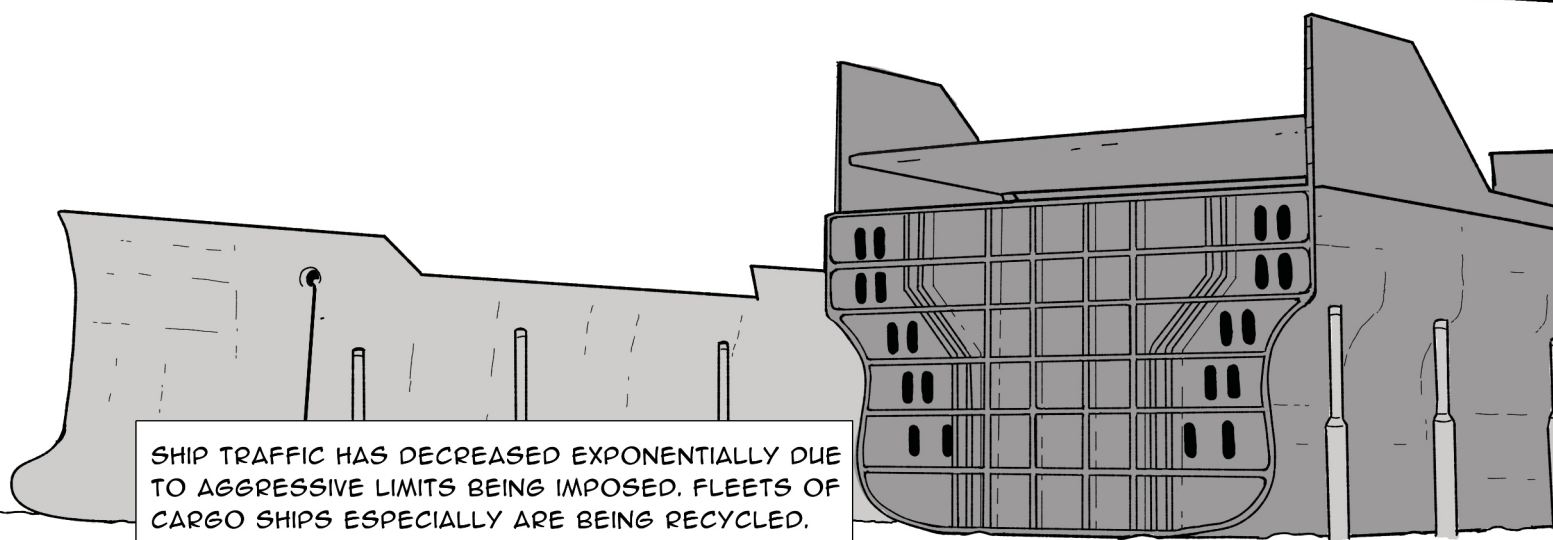
- Lampela, K. (2017). *Taiteellinen tutkimus metodologisessa maisemassa*. <http://agon.fi/article/taiteellinen-tutkimus-metodologisessa-maisemassa/>
- Lindley, J., & Coulton, P. (2015). Back to the future: 10 years of design fiction. *Proceedings of the 2015 British HCI Conference*, 210–211. <https://doi.org/10.1145/2783446.2783592>
- Lummaa, K., & Rojola, L. (2014). *Posthumanismi* [Lisäpainokset: 2. p. 2014. - 3. p. 2015. - 4. p. 2016. - 5. painos 2016.]. Eetos. <https://eetos.org/2014/08/18/eetos-15/>
- Maanen, J. V. (2010). A song for my supper: More tales of the field. *Organizational Research Methods*, 13(2), 240–255. <https://doi.org/10.1177/1094428109343968>
- Morgan, D. L. (1997). *The focus group guidebook*. SAGE Publications, Incorporated.
- Murata, K., Arias-Oliva, M., & Pelegrín-Borondo, J. (2019). Cross-cultural study about cyborg market acceptance: Japan versus Spain. *European Research on Management and Business Economics*, 25(3), 129–137. <https://doi.org/https://doi.org/10.1016/j.iedeen.2019.07.003>
- Oxford Reference. (n.d.). *Cyborg*. <https://doi.org/10.1093/oi/authority.20110803095655634>
- Redström, J. (2017). *Making design theory*. The MIT Press. <https://doi.org/10.7551/mitpress/11160.001.0001>
- Sterling, B. *Shaping things*. 2005.
- Vienna declaration on artistic research*. (2020, July 26). Retrieved May 19, 2024, from <https://cultureactioneurope.org/news/vienna-declaration-on-artistic-research/>
- Warwick, K. (2014). The cyborg revolution. *NanoEthics*, 8(3), 263–273. <https://doi.org/10.1007/s11569-014-0212-z>

A Scifi prototype comic

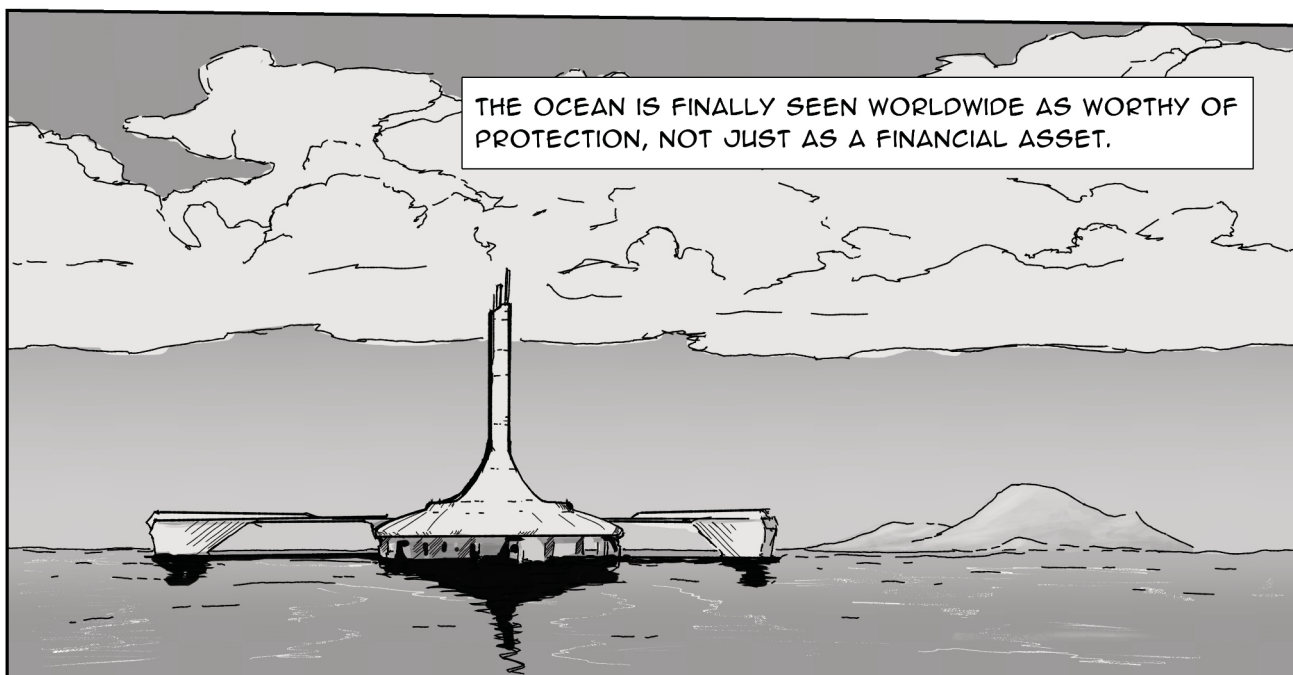
The next pages include the scifi prototype comic with the cyborg design.



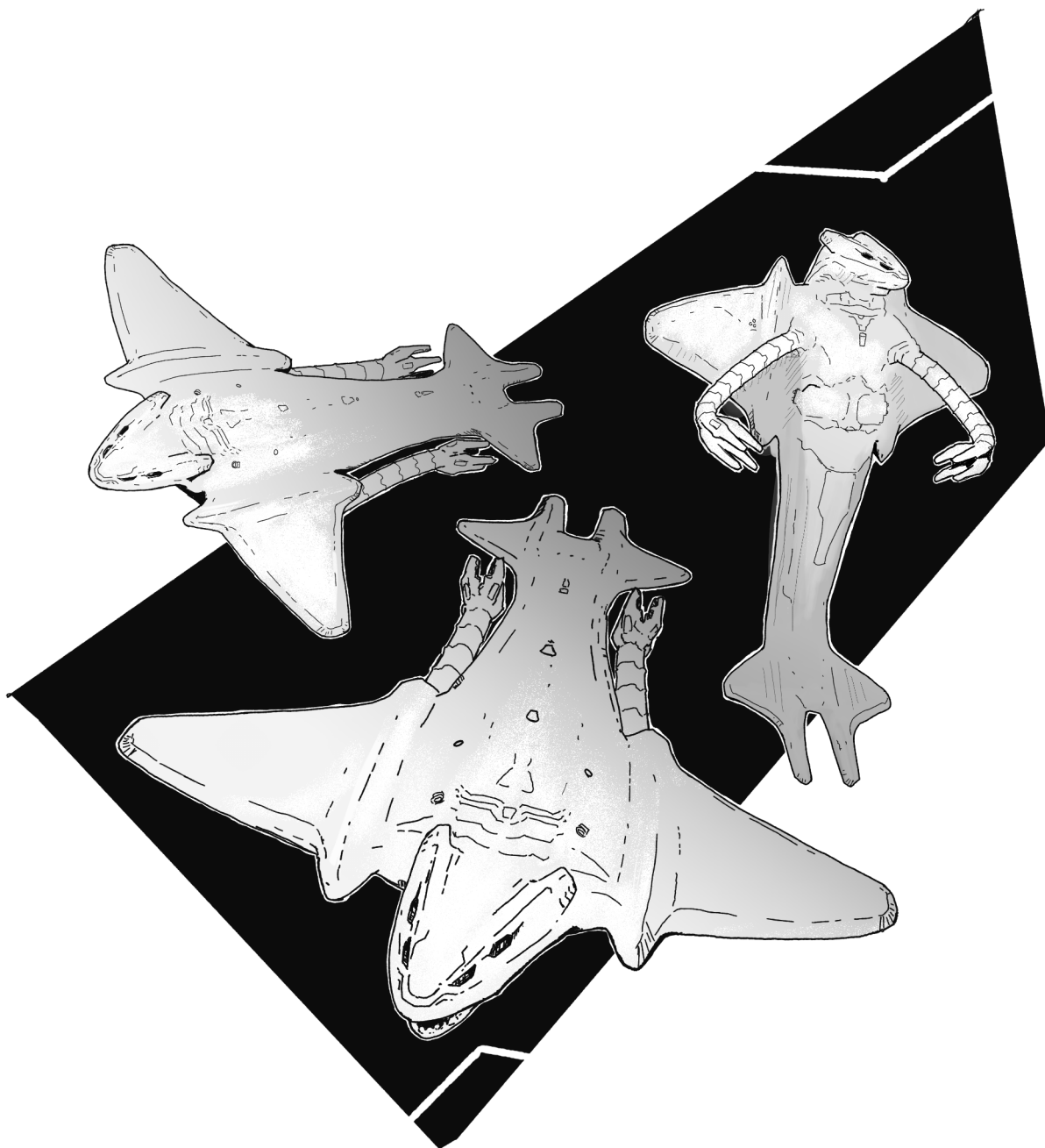
THE OCEAN IS RECOVERING, BUT IT'S IN A BAD CONDITION DUE TO HUMANS LETTING THE CLIMATE CATASTROPHE RUN RAMPANT FOR TOO LONG.



SHIP TRAFFIC HAS DECREASED EXPONENTIALLY DUE TO AGGRESSIVE LIMITS BEING IMPOSED. FLEETS OF CARGO SHIPS ESPECIALLY ARE BEING RECYCLED.

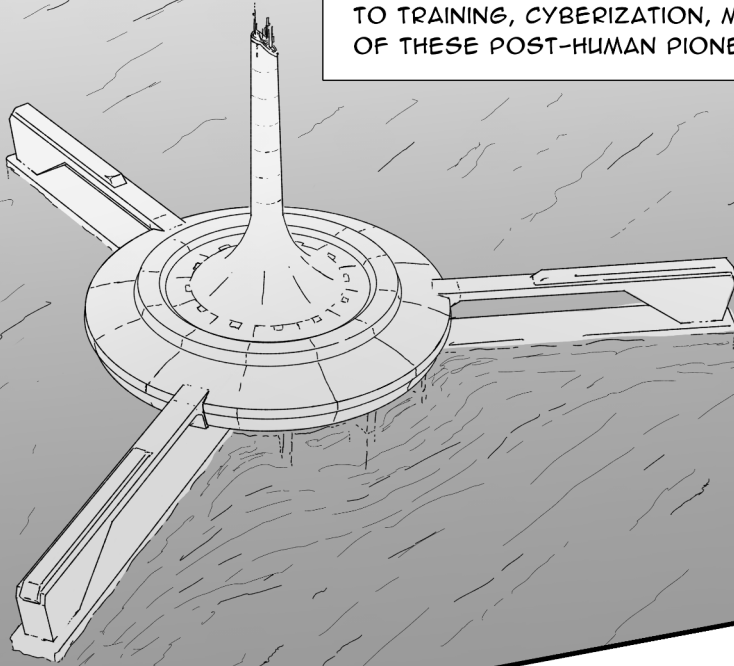


THE OCEAN IS FINALLY SEEN WORLDWIDE AS WORTHY OF PROTECTION, NOT JUST AS A FINANCIAL ASSET.

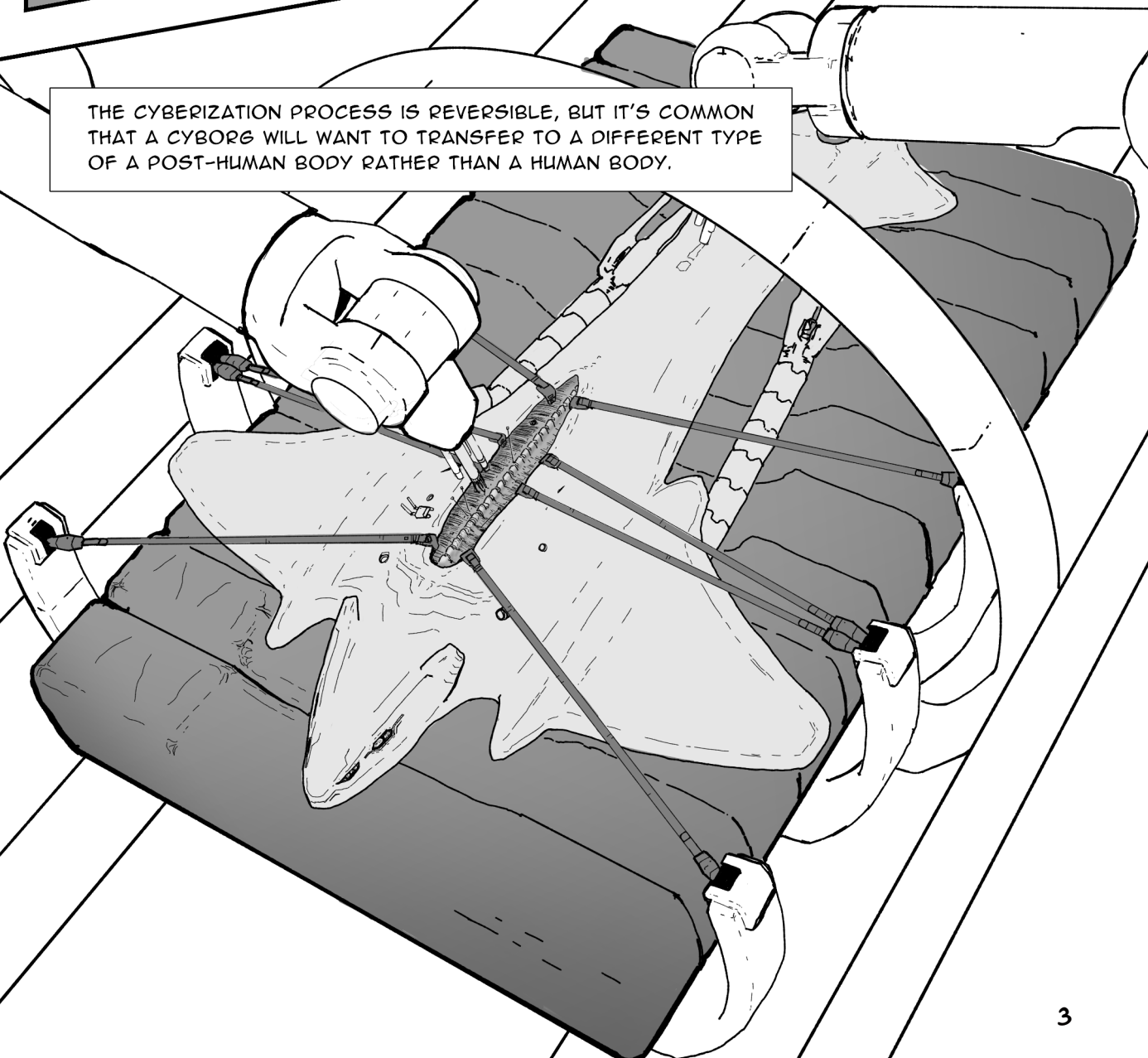


THE AQUATIC CYBORG IS CREATED TO BE
A MEANS TO RESEARCH AND PRESERVE WITH
INVASIVENESS OF THE OCEANS BEING KEPT TO A MINIMUM.

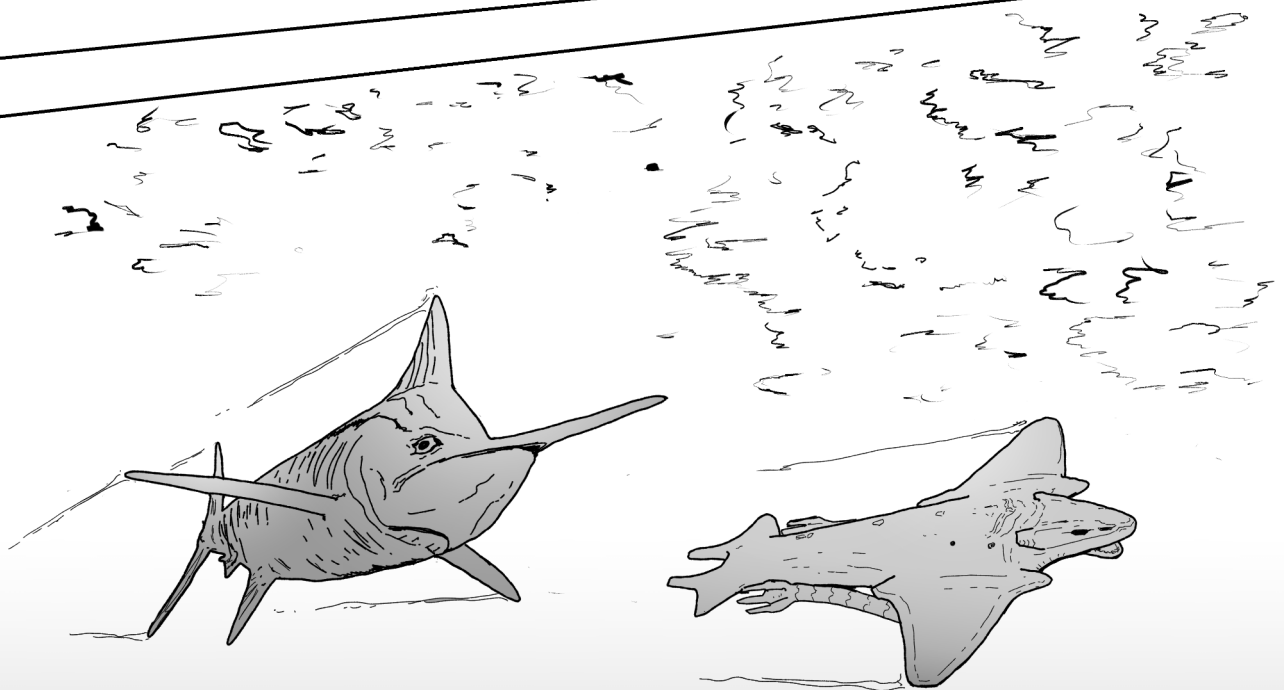
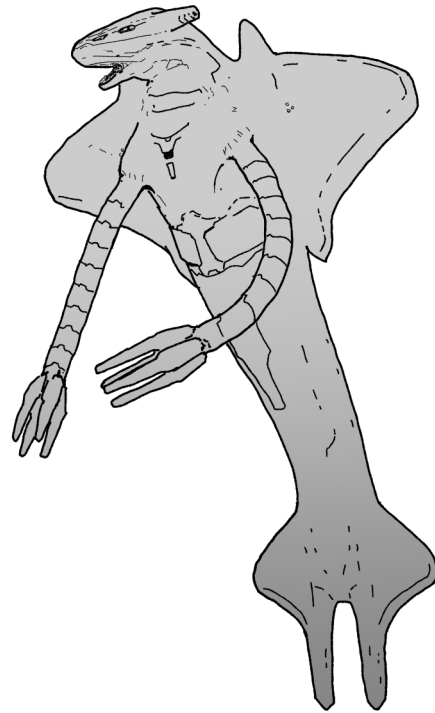
A HANDFUL OF FACILITIES AROUND THE WORLD ARE DEDICATED TO TRAINING, CYBERIZATION, MAINTENANCE AND MANAGEMENT OF THESE POST-HUMAN PIONEERS.



THE CYBERIZATION PROCESS IS REVERSIBLE, BUT IT'S COMMON THAT A CYBORG WILL WANT TO TRANSFER TO A DIFFERENT TYPE OF A POST-HUMAN BODY RATHER THAN A HUMAN BODY.

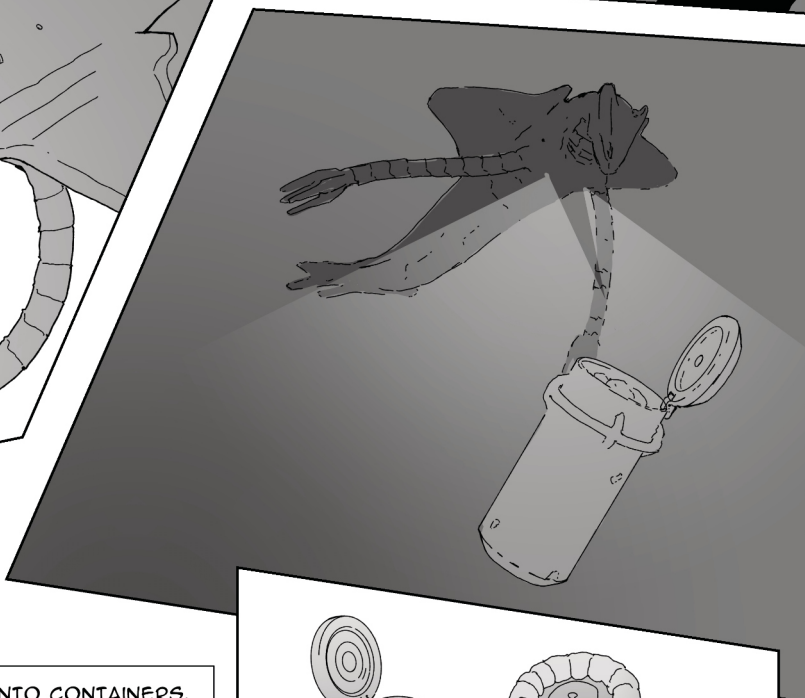
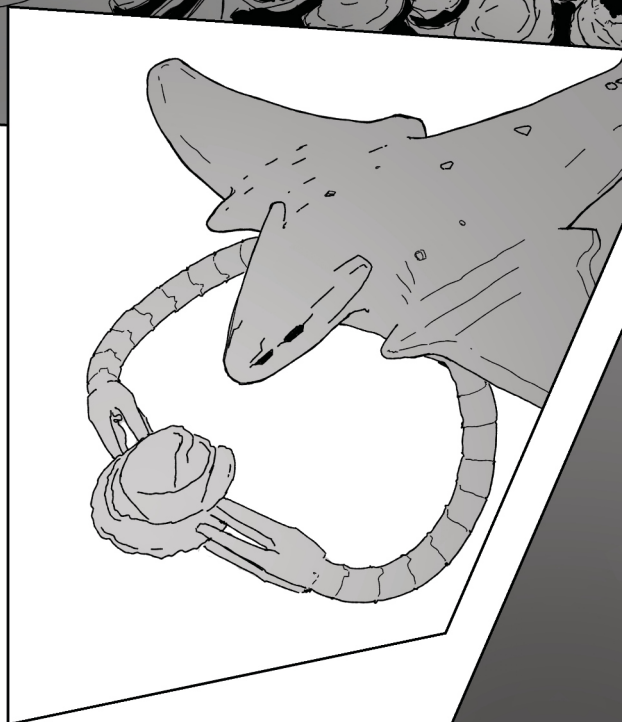


THE BODY WILL ENABLE THEM TO LIVE AND FUNCTION IN DEPTHS WHERE HUMANS WOULD NOT SURVIVE WITHOUT A SUBMARINE OR SATURATION DIVING EQUIPMENT.

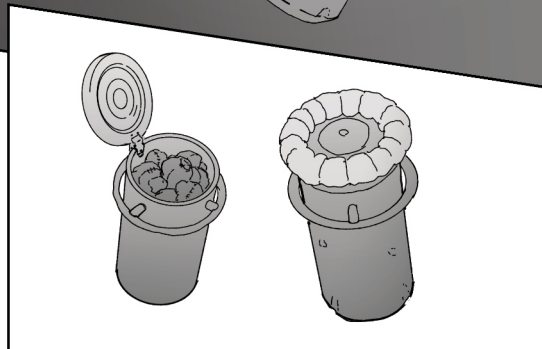


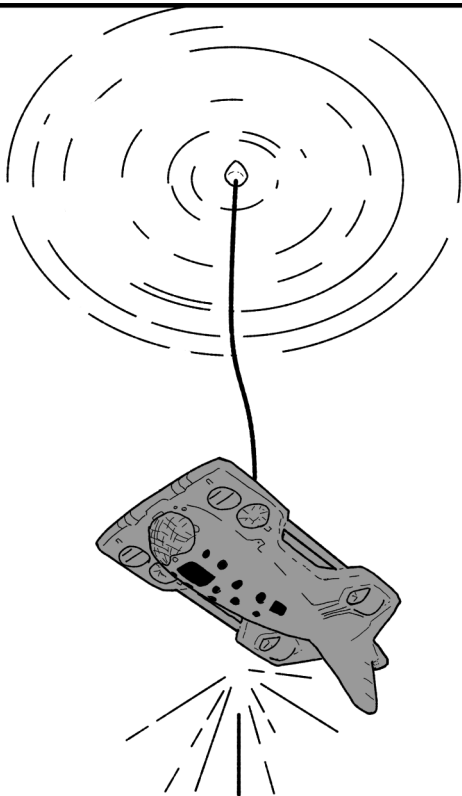


AS PART OF THEIR ASSIGNMENT, THE CYBORGS ARE RE-PLANTING FLORA AND FAUNA UNDERWATER TO HELP THE DAMAGED ECOSYSTEMS.

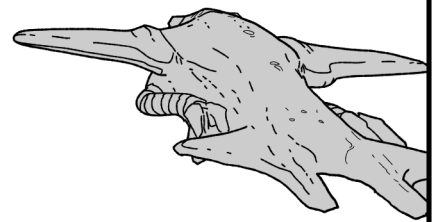


THEY ALSO COLLECT SUNKEN TRASH INTO CONTAINERS. THESE CONTAINERS HAVE INFLATABLE FLOATERS IN THEM FOR EASY COLLECTION FROM THE SURFACE. ONCE EMPTY, THE CONTAINERS SINK BACK UNDERWATER TO BE RE-FILLED.

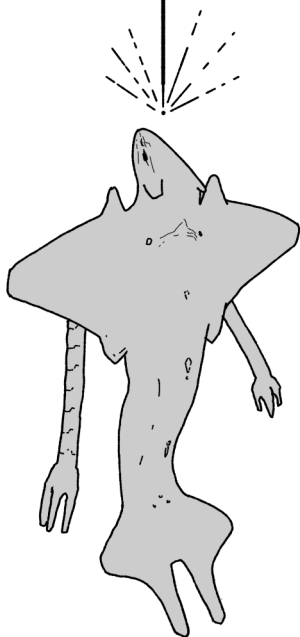




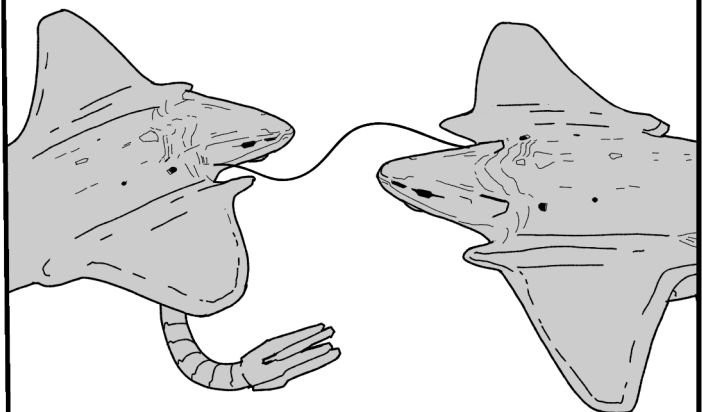
THE CYBORGS CAN TRANSFER DATA BETWEEN EACH OTHER, BUT ONLY OVER RELATIVELY SHORT DISTANCES DUE TO PROPERTIES OF THE SURROUNDING WATER.



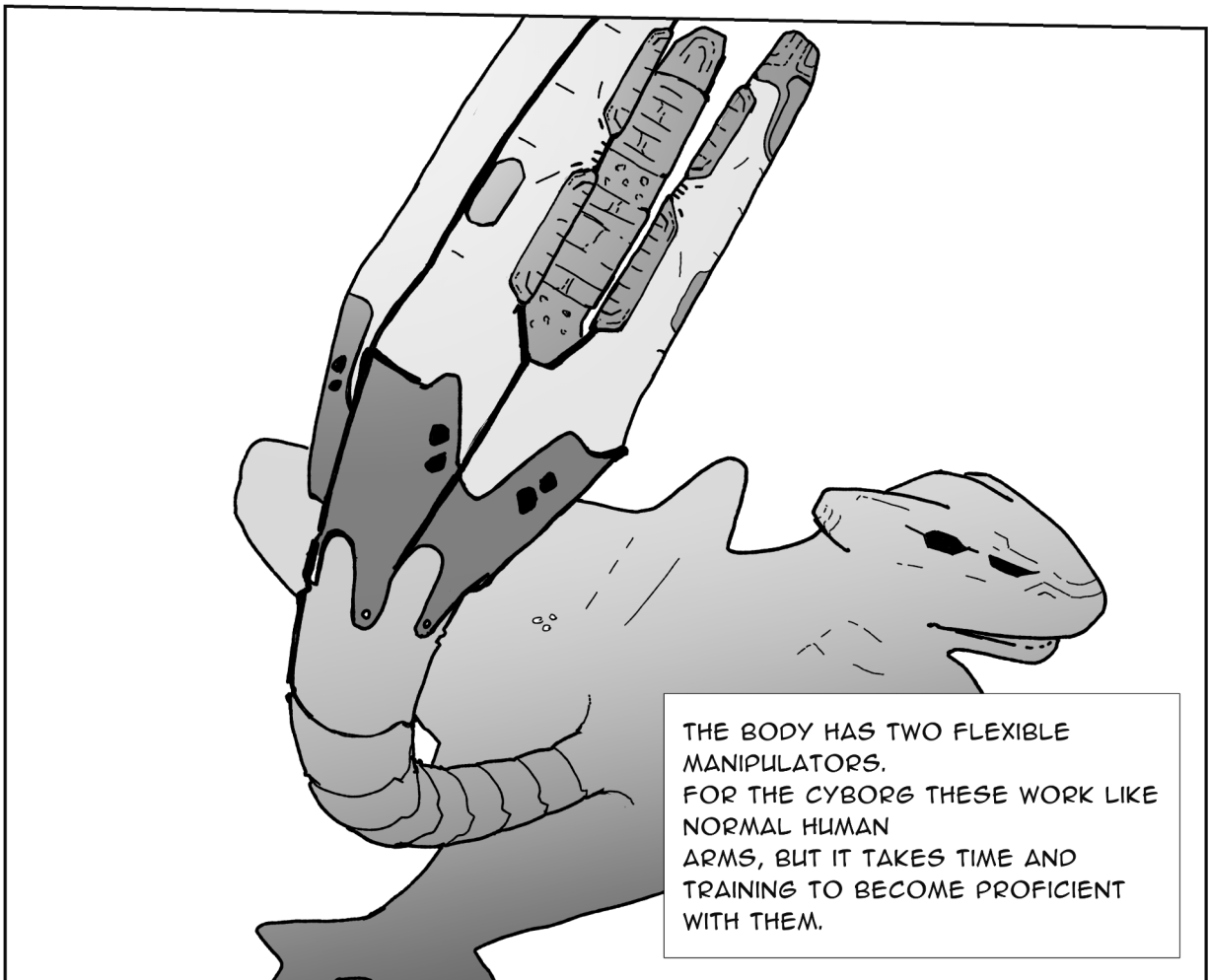
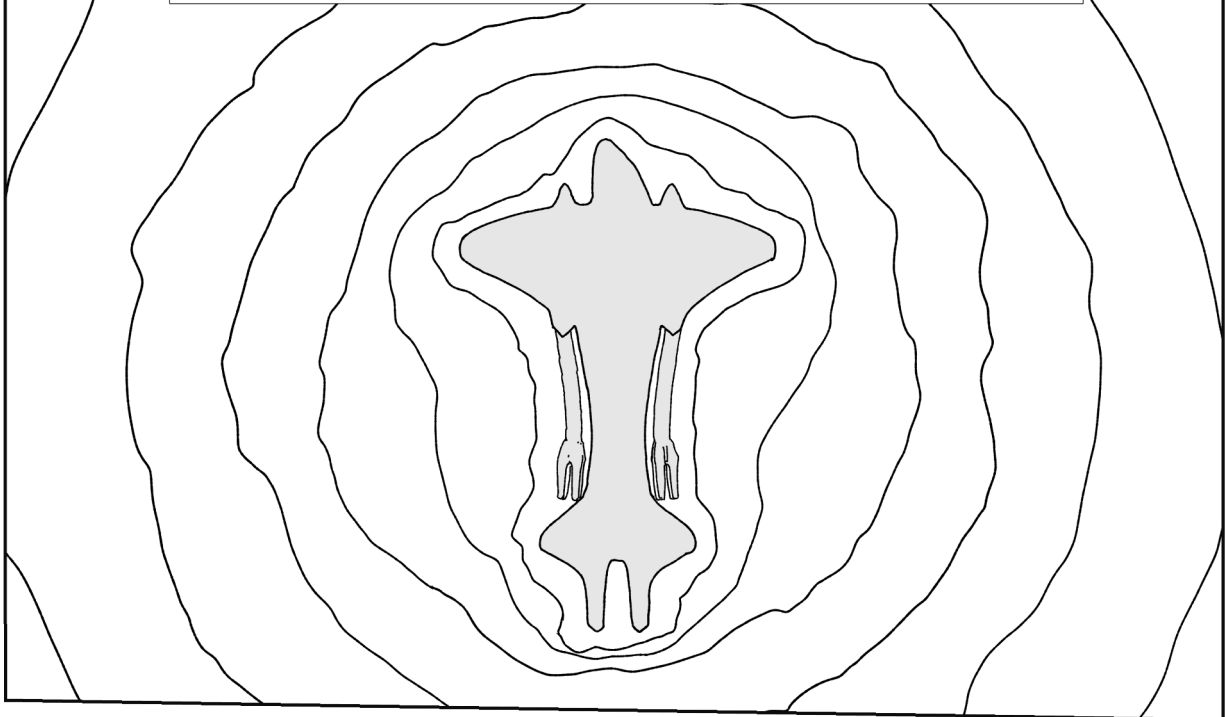
COMMUNICATION WITH THE SURFACE WORLD IS HANDLED THROUGH DRONES. THESE DRONES HAVE A CABLED SURFACE BUOY FOR SATELLITE AND RADIO CONNECTIVITY.



WHEN NECESSARY THE AQUATIC CYBORGS CAN SPEAK THROUGH A WIRED INTERFACE. THIS TYPE OF CONNECTION ENSURES THE BEST QUALITY WITH MINIMAL INTERFERENCE.

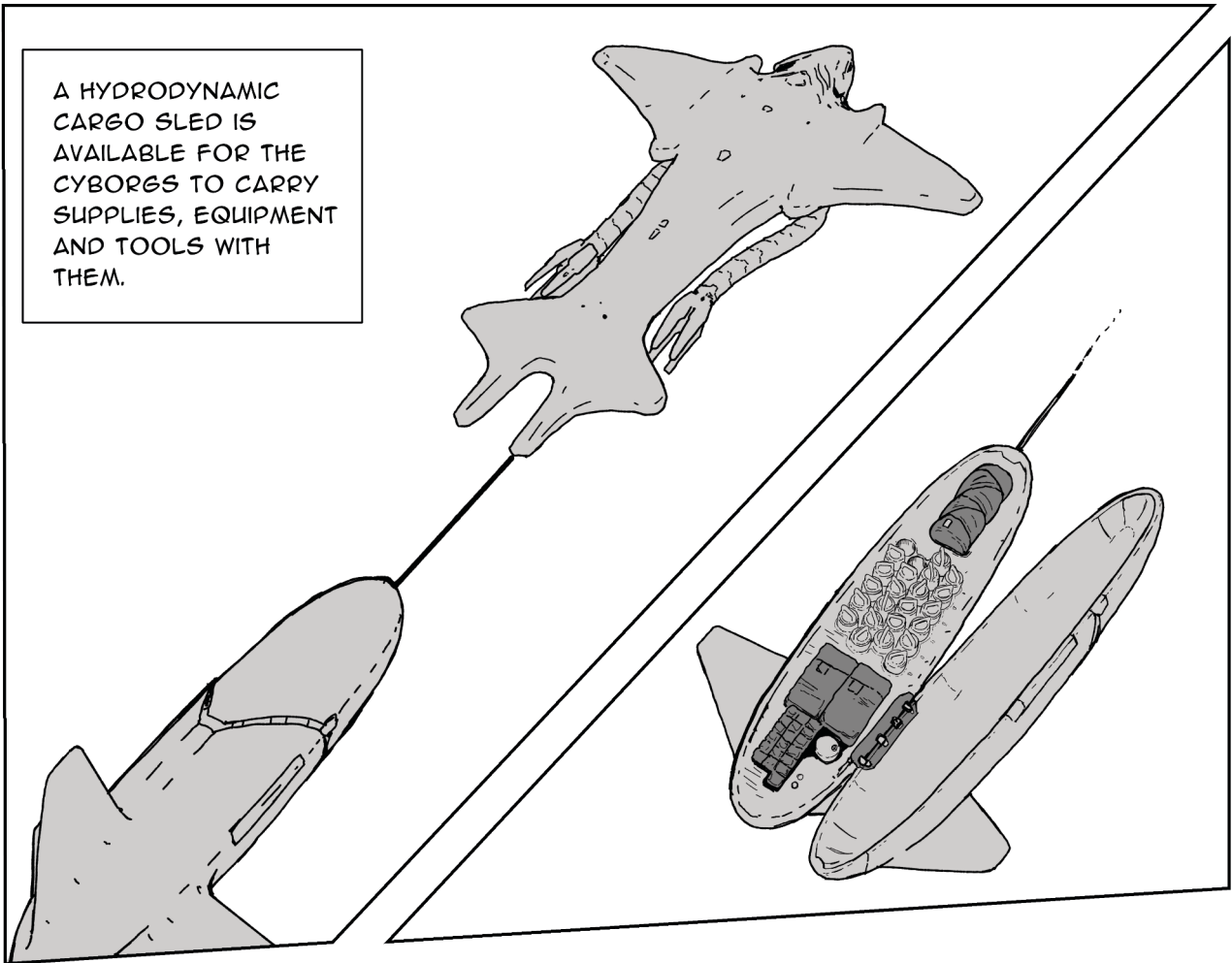


THE AQUATIC CYBORG, COMPARED TO A HUMAN, IS AUGMENTED AND TRAINED TO NATURALLY INTERPRET VISUAL, AURAL, ELECTROMAGNETIC AND SONAR DATA UNDERWATER.

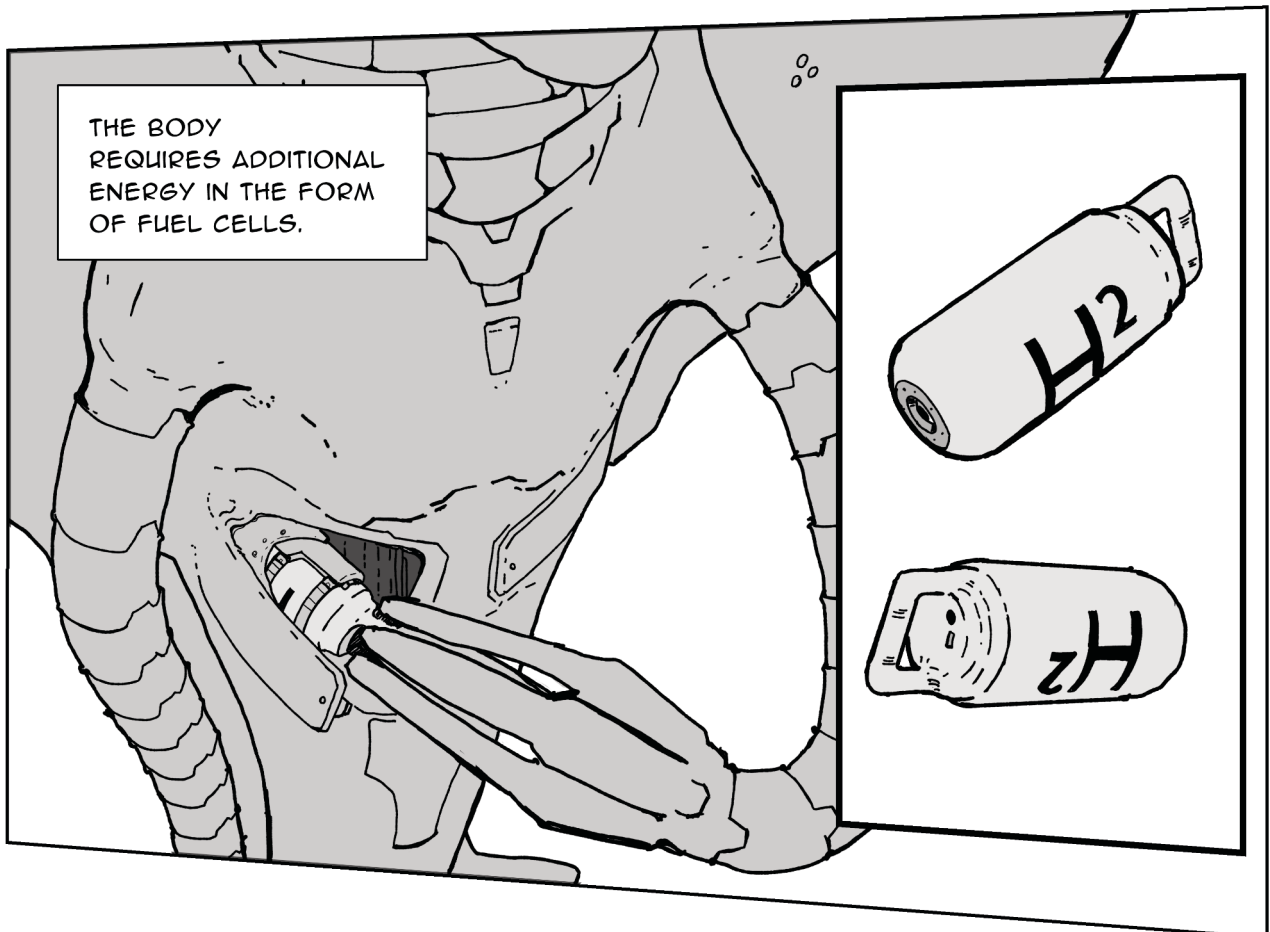


THE BODY HAS TWO FLEXIBLE MANIPULATORS. FOR THE CYBORG THESE WORK LIKE NORMAL HUMAN ARMS, BUT IT TAKES TIME AND TRAINING TO BECOME PROFICIENT WITH THEM.

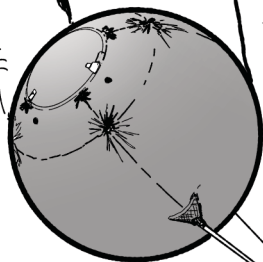
A HYDRODYNAMIC CARGO SLED IS AVAILABLE FOR THE CYBORGS TO CARRY SUPPLIES, EQUIPMENT AND TOOLS WITH THEM.



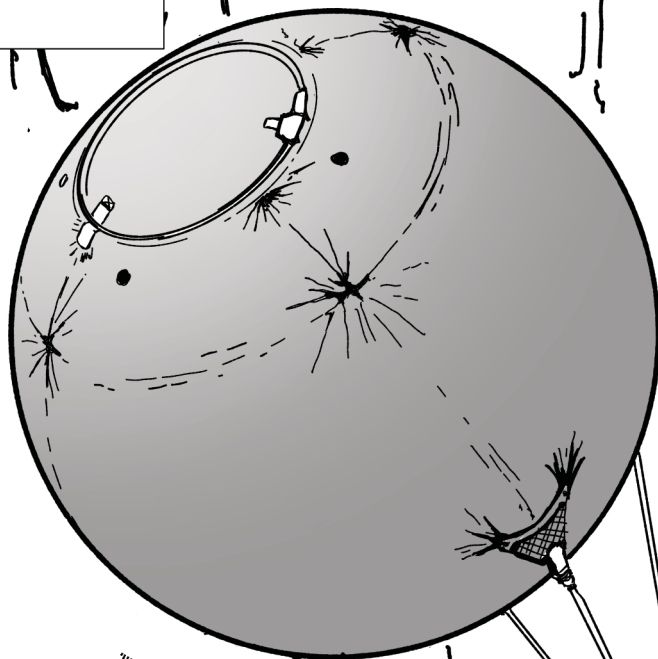
THE BODY REQUIRES ADDITIONAL ENERGY IN THE FORM OF FUEL CELLS.



WHILE HEAVILY AUGMENTED, THERE IS STILL A "HUMAN" BRAIN AND CONSCIOUSNESS INSIDE THE CYBERNETIC BODY. THIS MIND INSIDE THE MACHINE NEEDS REST.

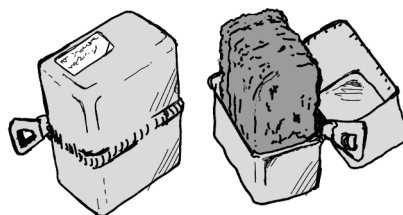


FOR THIS PURPOSE, THE CARGO SLED CONTAINS AN UNDERWATER TENT.

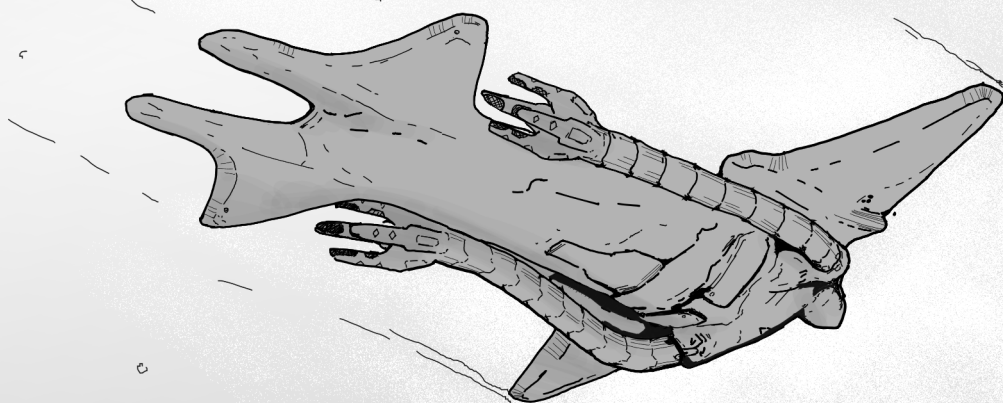


THERE'S THE NEED FOR FOOD TOO. THE CYBORG IS ABLE TO DIGEST ALMOST ANYTHING WITH NUTRITIONAL VALUE.

A NORMAL MEAL FOR OUR AQUATIC CYBORG CONSISTS OF A COMPRESSED RATION IN A REUSABLE WATERTIGHT PACKAGE.



IF NEED BE, THE CYBORG CAN EAT FROM THE SEA. THIS IS DISCOURAGED UNLESS NECESSARY.



THESE POSTHUMANS LIVE IN A VERY DIFFERENT WORLD FROM HUMANS. IT'S A MASSIVE PHYSICAL AND MENTAL CHALLENGE, ADAPTING TO THIS LIFE.

BUT THE VALUE THEY PROVIDE TO THE ON-GOING RESTORATION AND RESEARCH OF OUR OCEANS IS IMMEASURABLE.

NOT TO MENTION THE KNOWLEDGE INTO POSTHUMANITY THEIR EXISTENCE PROVIDES.

B Process diary

Here is the process diary I kept during the making of the scifi prototype. With some omissions and edits to remove names and some personal information, the next pages contain the raw thoughts I wrote down.

Diary begins.

In the scope of this thesis, focusing on a piece of something new would be like designing a hand prosthesis for a future human. Valid, but I'm trying to design the whole human, the sum of its parts, but changed so radically that they can be regarded as "post", after human. There seems to be a philosophical debate on what "post" means in this context, but I'll leave that to those who are having that debate. In this thesis, I'm using "posthuman" as something that comes after human, something not human, but also something that once was human.

Also, I will attempt to focus on the verbs of a human, how humans do things, not what it means to be human.

In the end, these are product designs, weird as that sounds from an ethical standpoint, so what I will design are more like vessels for the post-human human to make their home in.

Science fiction needs to be opened up a bit here. The keyword is "fiction", and so will my prototypes be too. They are not aiming to be anything but fiction, as their sole purpose is to imagine different futures without trying to answer how we could get there. Of course, the word "science" is in there too, and so it shall be in my prototypes. Science functions as a basis for the ideas I'm designing, but I will likely use other works of fiction for help there too. My reasoning for is that other people doing sci-fi have thought of similar subjects already. Why should I not acknowledge them, to tell you the reader that "yes, this has been thought of already, but I'm thinking about it from another angle."

Posthuman challenges and designing for those
Posthuman problems require posthuman solutions

So this is a real discussion that needs to happen constantly with myself. I'm designing a cyborg body for humans to use for extended stays underwater. The first thing I'm doing is researching how humans function underwater currently, what we need and have available to survive currently and from there I start seeing a picture of "what would be needed to make the kind of a cyborg body to fill these needs?"

Fortunately we know a lot about human survival underwater nowadays, so there is material to use as reference.

I'm thinking about the design at this point, not really about the science fiction prototype. The story should be build out of the design, the requirements on humans within the design and then the effects of the design.

Maybe it will become a usable way of examining design through fiction?

Thinking about modularity or multiple use scenarios. The human using this body could need to be able to function out of water too, so how to compromise between these scenarios?

Following the idea of posthumanism where we try to be less of a parasite to the environment we live in, one could assume that the oceans would not get colonized and commodified in that type of a posthuman future.

So there would not be enough or the right kind of resources underwater for this posthuman to survive solely from those. The ability to come to the surface and function in a surface, human environment simplifies things

Is the body just a big cyborg crab?

I'm starting to visualize ideas in my head already at this point. Should not use too much time on that as I feel there aren't enough base points to make a proper design, even a rough one. On the other hand, it's a positive sign.

There is a question of "what does a full cyborg body" mean, in my head. Is it full cyberization, replacing everything physical in humans?

Is it augmentation of varying levels, like changing everything but the brain for instance? Where does personality come from? Is the body as a memory device important?

This is getting too philosophical. While I do think it would be important to include these questions in an actual design process involving cyborg bodies, with this thesis I'm going to focus on what the body needs and how would it be done.

And then I ask myself if thinking about these things will actually answer the part of SFP where we have to ask "the ramifications on humans" and "how to solve problems of the idea".

Thinking of things outside the body that would have to be solved.

Logistics of everything, needed resources for the body to function, facilities to repair the body

Changing from the aquatic body back to something else?

Maybe not in the scope of this design.

Would likely be easier if it was thought of before cyberization, so a change would be easier

Now finding inspiration when it comes to shape, movement and appendages

Is the human brain plasticity good enough to manage completely different ways of physical function?

Like tentacles for arms, as long as the signals are correct?

Got to draw something, visual development to move the ideas forward?

So yeah. Making a human look like a fish does make the human something other than human, in a literal, physical, sense. Not the direction I'm looking to go into, so let's attempt something that is "more than" human, not other than human. Is it human+? Transhumanism? Can I Make it more than human without necessarily being better?

It's going to result in a body that is better than a human body in some way, however I try. That's the aim when augmenting, like I'm trying to make a human that can survive and function underwater for extended periods of time. That's better than a human, not just more. It's more an annoying paradox, not a problem that prevents me from making design for a posthuman.

A posthuman human can also devolve, or be a cube. It's not a clear subject as we can't agree on the definition. To me the best definition is that there is no way we can define a posthuman as we are not yet posthuman ourselves. So somehow we would be able to perceive a change big enough in the future that we could collectively, or academically collectively, decide that "yeah, we're posthuman now".

The whole point of this first prototype is to design body that's good at being underwater, helping research, preservation and such. Automatically something that is better in these things will be better at assisting in other things, like military related things, but oh well.

Let's try and design the least invasive full body conversion.

The brain does not need to be replaced, as it apparently does not have documented

problems being underwater. Blood has problems being underwater, so that will affect the brain, but other than that it's fine.

It's more than human when it can do something a human, even a superhuman, could not do. Transhumanism wants to make superhumans that fuse with an ai and become something stupid, I don't want to make that. An expansion into something more than human is more futureproof than just...more human. As witnessed by what types of humans identify as transhumanists (billionaires, wannabe billionaires)

I'm not trying to solve a problem with any means necessary. I'm trying to solve a problem with a specific tool, technological augmentation of the human body.

The Legend of Zelda: Ocarina of Time has fishpeople in it, called Zora. so Of course my first rough sketch looks like one of them. It's an idea though.

The ergonomics of a human don't really work underwater. That might be why we don't have animals that look like us in aquatic environments.

<https://www.youtube.com/watch?v=B8xCeMTCxTY> Everyone starts by colonizing a hostile environment. It's always "for humans"

DO I have anything else in my mind but fishpeople?

<https://www.youtube.com/watch?v=q1L2NMGvUU> Why does popular science want to colonize everything?

Should the body be physically durable? The ocean can be a scary place, so maybe. Could also add some mental calmness for the user to know that the body would not stop working from a bump.

The inspiration is coming from marine animals and current technological ideas in marine robotics and such.

And scifi, concept art for entertainment.

So where do the aquatic cyborgs get energy and nutrients?

Hydrogen fuel would likely be a good option

Could eat things from the ocean, would likely need a lot of biomass though.

Not necessarily with future solutions in energy efficiency, but highly likely.

Food consumption and conversion to energy is possible, so why not just have the cyborg eat food designed for them (GitS)?

How does one make a story out of design? The rules of SFP are there, so try to use those first and see where it goes. At this point the design feels like it has enough things thought out that I can write a story out of it. Meaning that it can answer the SFP questions and create the SFP problems. And if it can't, you need to design more. "I can't write this, so the design needs to do more, be better, more comprehensive."

Design can give ideas that are comprehensive to the point of technologies involved in realizing a product, but it's really hard to have the correct technological, or any solution outside of the designers field of knowledge. With my designs here, I have a hunch on how things could work, like hydrogen cells as additional power for the body, but they are in no way researched up to the point of implementation as I am not an expert on those. In a project that wants to create a functioning product there are experts from many fields involved, including design.

I really do not want to use the word "transition" when talking about the cyborg body and how a human becomes posthuman. Transition is used today to describe transgender people transitioning to their proper gender and using the same word for cyborg augmentation in the context of these designs feels like the wrong choice.

17.4.2022

Starting the first prototype storyboard. I think a storyboard visualizes the story better than words...which sounds really obvious. Thinking that it is important to also include more illustrative images of the design and parts of the design, but the story can be told in the storyboard form.

Is it important to make more detailed, illustrative images of the design? Do those serve a purpose within the SFP or are they more about the design for designs sake?

A detailed depiction, be it written, illustrated or otherwise, should logically convey more information about the subject.

The intent is to communicate an idea, with cause and effect. The quality of this communication should be enough to convey the contents. Maybe the aim should be to strive and leave less room for interpretation, rather than telling an abstract story with abstract images.

Is it important for the prototype to be detailed?

This is not the final design...it's not supposed to be. It's supposed to be a prototype, which is then prototyped within the SFP.

Feels like a revelation.

This might not want to try and do the normal cyclical design process, but rather get a solid idea going and prototype it through SFP. Just because SFP has the "Ramifications" and "Human inflection point" parts in it, which are, as described by Johnson, supposed to be used as observational and reflection tools within the prototype, about the technology / design.

The Human inflection point especially tries to answer questions about improvements

to solve possible problems.

A problem: what I'm doing here is not a prototype of something I have no control over. The steps 4 and 5, observation and reflection, feel like artificial limits when I could just go and change the design so the problems are solved. Maybe that's the solution?

It won't be the solution, as it will result in the cyclical design process being introduced to SFP, which defeats the purpose of a one-off prototype from which we can then learn and iterate

Is SFP another way to try and control opinions people might have? By introducing ideas through scifi story, are they made more palatable, but also simplified into "oh it just works like this" because people naturally accept a story that has it's ups and downs and then ups?

One could realize in the middle of a prototype that something about the design is wrong or needs improvement, but the prototype should still be finished before making these improvements if it's not utilized as a part of the design process. Which in this thesis it's not.

Making the prototype this way does not benefit the individual designer, or a group of them that much. Reasons for using this method could include introducing the idea to people outside the design group, as internally a question like "we now realize the problems, why should we continue without iterating on the design?" will likely come up and if there are no time limits imposed on the design then why would the iteration not happen?

As I thought earlier, SFP would become a part of the design process, rather than be a tool for examination and validation for a design phase. Bigger picture needs to be taken into account, which this thesis does not and can not do.

Communicating the ramifications by image alone might work. For example, a series of

images showing what needs to be done to the human undergoing this change should have enough detail to drive the point home.

Then showing the care after the process, training, setbacks due to adjustment.

Can the process fail or become too unstable to sustain?

In the SFP examples there's usually one specific problem that emerges from the technology or such being used. With design there are multiple problems, but communicating all of them might be too much for this thesis. Or rather, communicating them in detail. A montage of problems like there is a montage of the possibilities for the cyborg could work here too.

Speaking of examples, my way of using the SFP method is obviously different due to it lacking a definite scientific base to the technology or idea examined. This I think needs to be pointed out and expanded on.

Am I confusing the order of things? The ramifications are the problems, the dire situation like Johnson says.

More drama is needed to drive the ramifications. Becoming a cyborg is not a small thing. Functioning in the intended environment is not a small thing.

To make the prototype impactful, one can't make the situation optimal to the characters experiencing it. Like Johnson writes, going to an extreme helps the story.

Situating the story to a time where cyberization is not yet a common thing to do would help with finding problems. It's also more familiar to the reader to try and understand the humans of my story.

It's a story. I can introduce a problem that the "heroes" can't solve immediately, but I already know the solutions which I will show when the problems have taken their toll.

One really has to think about telling a story here.

Should a single SFP focus on one problem and the solution to that? Or should it be allowed to tackle multiple problems the idea might have? Does it get confusing for the reader?

Does it get too taxing for the thesis is a better question.

Choosing one problem should be enough to test the method in the context of this thesis

I do not have almost any experience in writing stories, so making it more complicated for me is not wise

As a designer I'm interested mainly in how the design and the ideas within would work, so that's what the prototype should focus on. This also helps in narrowing the scope, as the thesis is interested in the method of SFP. Complicating things does not necessarily make them better.

The design in this thesis is "naïve" as it doesn't discuss things with other professions related to such a design working. It's a "what if" without too much thought put into manufacturing and such. I do think that that's what it should be, but feel the need to point it out too.

So first we convey the design in the "build your world" part. Then we show how the design changes the people using it. Then we get a problem that's inherent to the current iteration of the design when used by the people in the story. Then we figure out a way for the humans, in this case posthumans, to solve that problem. Then we get the characters to have a discussion about what they, or us, have learned from this ordeal.

A problem I'm seeing and might have already discussed is how I'm the one making the design and the prototype of the design. This could also work as an exercise in looking critically at your design, or maybe even force one to be extra critical as the story will

show the gaps in the design. Not necessarily to you as a designer, but as a researcher or reader. Switching between the roles is something that has to be learned and trained.

Then again, avoiding the cyclical nature of the "normal" design process is something that one would want if using a method like SFP in the manner depicted here and this I've said earlier. Keep it simple and flowing and SFP can benefit the process greatly I think. But get stuck in iteration and refinement and it will just feed the beast, like it will even without SFP. This could also just be a good thing while doing research, or with strict project deadlines, but still.

So now I have the story planned out. The first part needs me to "introduce the science", in my case the design. I'll flesh out the design now to a point where it should be solid enough to "be believable".

Because I've chosen to visualize the story, the choices I make in terms of how I visualize the design matter. In this case I know that I want to illustrate many pictures where the design, the cyborg, or parts of it are in focus. If I make a non-detailed 3D model as a base onto which I can draw details if needed I should be able to focus more on the storytelling, as opposed to getting the illustrations done. As long as they communicate the story they should be good, but maybe one should not forget or forgo aesthetics altogether.

Pretty pictures are more pleasant to look at and can feed the imagination better I think. Is this subjective? Yes and no, but not the subject of this thesis.

Re-thinking it after supervisor said it and reading the Radical Oceans Futures prototypes it does feel like it's a good idea to make the story have fewer parts and focus on the design and the "scientific inflection" point, with a positive take on what the design, the cyborg possibility, does to the posthumans and what it enables them to do. So a story about the design and what implications it would have on people / posthumans.

What's the purpose of the SFP story? Johnson in his book focuses mostly on inter-

viewing people who make sci-fi in various forms, but is a good story actually the end result we want here or would it be better to get another way to communicate a design concept out of this?

2.5.2022

making the design, modelling in 3D to get a base to draw on in different situations and poses. Thinking about technical execution, but trying not to overthink it so I can keep the prototype moving. Noticing how I'm not happy with a haphazardly designed artefact, as I already had a somewhat working model and I went and iterated on it.

I said earlier that the design needs to be "finished" enough, detailed enough so that one can make a story out of it and I still stand by that. An abstract idea is more of a McGuffin, as if you don't make the idea detailed enough it can, in the extreme, be anything and fulfil any task. Smart goo or something like that, nanomachines solve everything.

Need to make this iteration the final one and move on. I also don't trust myself enough to make the illustrations without any reference models or such. Also, using a familiar technique takes some stress out of the whole thing, I'm not intentionally trying to learn a new way of doing design here.

So let's return to having ramifications present in the story, as that seems to me like a defining feature of SFP compared to just scenarios.

Can I do a prototype with the design as it is now with the full cyborg sort of modelled and almost ready to be used as a base model? I think so. It does not matter if it's not iterated or "good"

8.5.2022

Make the manikin, keep it simple, move on.

I am not happy with the design, but I think that's normal and should be accepted in order to get this prototype done.

Getting back to making the proto. The illustrations are making me think of how the cyborg body is made, what's needed to maintain or store it and other things related to it. The work needs to be done so the story can be told visually, in an interesting and informative way. An example is how the body is prepared inside the facility, how its different limbs and parts are supported for maintenance.

9.5.2022

Making illustrations, adding text to them, going for a comic / manga style in terms of aesthetics and line use. See if I can at least, not done anything like a comic since elementary school.

Again thinking how much I can communicate with images and if interpretation could be not just allowed, but encouraged? Meaning, that the less I explain through text the more the visuals need to "speak" to the viewer, and images are easily interpreted, gaps filled by imagination...but that's true for text and especially stories too.

This part of the process feels more like a technicality than using the method of SFP, but that technicality is necessary for the SFP to function. So what do I say about it?

Think about the media you're working with. in this case, it's a printed A4 with a digital version

It's not. The university does not print these anymore, not after 2020. even the library does not get a printed version. Kinda sad.

23.5.2022

The design does change while making the prototype. Things that I want to tell about are not necessarily designed, so it forces me to edit the design

24.5.2022

Ramifications are how the design affects the people using it, in this case the cyborg

posthumans. There's no rule that says the ramifications have to be dire or otherwise terrible for drama. In this case I'm going to use the ramifications to explain how the body changes the way that human, now posthuman, exists and functions with the body. It's not easy to become something more than human so that'll be ramifications enough.

Apparently hydrogen is really energy dense. Compared to the human body's energy needs a kg of hydrogen is...over a thousand times more than the human body would need daily. I know the conversion doesn't work straight up like that, but even small hydrogen fuel cells could possibly power the cyborg body for weeks, if we take some leaps of imagination and positive thinking.

2.6.2022

Making a visual prototype really benefits from me designing and conceptualizing things related to the core idea, the cyborg. Things like cargo storage while underwater, resting underwater in tents made for underwater cyborgs, even how they would pick up trash if working as clean-up for old-world trash in the ocean.

All of these need designing if the prototype is visual. It's a part of the worldbuilding, making the experience believable.

Decided to organize my plans a bit better as the comic is more than five pages now. Every page needs a storyboard, maybe a base model, then line art and shading(screen tone, manga-technique for b/w comics) Is it too much? I'm the one deciding that right?

5.6.2022

The ramifications include the (post)human inflection point in this prototype, as the ramifications are explaining the changes to the posthuman and how the changes are adjusted for by the posthuman or something the posthuman uses

This prototype is more like an intro to a story, or a story building up a world, than it is an actual story with good things and bad things happening like Johnson wants to. I am making a story about a design, focusing on the design. I'm not even trying to

personify any character in my story. The design is the character.

12.6.2022

Make it good enough so you're happy with it, then stop. Be happy that it's good enough, otherwise it's an endless cycle

I might have to re-design the cyborg, make it a bit more dramatic, a bit more foreign, a bit more post-human

13.6.2022

The cyborg is re-designed. A lot more post-human, a lot less human, but still obviously a cyborg.

18.6.2022

I was not happy with "good enough" so I went further. It needs to be consistent and good enough, but it's a personal good which is hard to limit when you lack experience from repetition, which I do not have in terms of comics.

20.06.2022

Re-topology is underway to make the model easily poseable.

Starting to add actual dialogue to the story. Hard to explain why I feel like a written addition makes the comic better at telling a story. Some things could be more easily communicated in writing, some with pictures, some with both. Maybe it's just a feeling, a taste that determines the format?

30.6.2022

More modelling

3.7.2022

Trying to finish modelling and rigging the cyborg.

7.7.2022

Still trying to finish the rigging and drawing of the cyborg

I said before that "using a familiar technique" would reduce my stress...but the stress is still there Now my wrist hurts, hope it's nothing serious.

Even with a familiar technique...with something unfamiliar also because I'm using Blenders Grease Pencil to draw on top of the model, this is still a new medium for me to work in. The comic I mean. The work I'm doing is mostly manual, mostly technical, as the design is now finally pretty much locked, but this part is that 90% sweat that needs to be there when making anything.

It takes time, and the time makes you question yourself. Trust the process, trust YOUR process like that one poster hanging on your fridge says.

8.7.2022

Implementing a clearer project management with Tape. Hopefully this helps me move forward faster. I had some project outline made, but haven't seen that in a while so likely outdated.

10.7.2022

Cleaning up my storyboard, listing things that I need to build for the comic.

A science-fiction prototype is a story that tells an idea through different chosen creative mediums. It's an introduction, explanation and discussion of an idea, all compressed into a digestible narrative format.

A scenario is a scenario is a scenario, but inside the medium of industrial design and design communication in general a scenario is not the general meaning of the word, but a construction, a stage through which the usage and adoption of an idea is communicated to a wider audience. A scenario like that usual does not contain any negative factors of the idea, it does not question try to incite conversation with the ones it tries

to communicate with.

I want to try and make this distinction. A science-fiction prototype shares similarities with a design scenario, but in the end it has different goals in mind.

Do I need to show how the cyborgs digestive system, or rather their mouth, works?
Can I just tell it through text? Do I lose something?

13.7.2022

Working on the comic

14.7.2022

Working on the comic

17.7.2022

Working on assets. Decided after having a conversation with the partner that putting a lot of effort into the 3D line art is not a good idea. Instead I should focus on using the 3D as a mock-up in order to realize the storyboard and then do the final line art in Clip Studio Paint

23.7.2022

Some modelling for the cargo sled, attempting to finish it during the next session. Redesigned it to look less like a skibox. Thinking about the fuel cells and how much energy one would have to contain to be feasible.

7.8.2022

Back to it after a longer break.

Finished the cargo sled model. Finished the manipulator tentacles, fingers need rigging.

Thinking about the style I'm going for, the aesthetics of my comic. Before I've said that I want to aim for an older manga style with their technical limitations, using

screen tone for shading and such.

That's a very time-consuming technique which also requires a level of mastery to get right, a level I do not have. What I do have is my own style of very lightly shaded pen drawings which I should just stick to as the results are good and I know how to control it. I haven't done a lot of digital work like that, but emulating it is likely to be easier than trying to emulate a style I have not learned at all.

I do think that if I could have created something that looked like older manga art, especially something from Shirow, I could effect the tone of communication. Would the tone translate for anyone who has not experienced that era of manga art? Likely not.

8.8.2022

A bit of project management.

Rigging the cyborgs fingers and realizing that the fuel cell hatches can't be where they were so re-positioning them.

14.8.2022

Small things. I know how the cyborg eats, but what is the preferred food to be eaten underwater? It should store in water without going bad, or have some packaging that isn't harmful to the ocean if accidentally left there. Or the cyborgs just make sure to pick up their trash, like a normally functioning human would.

Update: the food is a very spartan nutrition pack stored inside a watertight re-useable package. One package holds one meal and then the package is stored inside the cargo sled waiting to be returned and re-filled.

15.8.2022

Designed and modelled the ship-breaking frame mock-up. Polished the cyborg facility mock-up.

16.8.2022

Making better corals

17.8.2022

Still making better corals.

Made better corals and got the coral field frame mock-up done finally. Happy with it, but of course the medium I've chose limits the view when trying to convey an expansive field of corals, or anything else. Work with the medium, not against it, but lament the lack of flexibility anyway.

21.8.2022

Made a simple scuba diver, for the comparison or meeting frame with the cyborg. This frame is supposed to simultaneously show the rather startling difference between these two existences, but also to ground the cyborg into a world where humans with scuba diving gear still exist.

23.8.2022

Asset making continues.

I did read on creative-science.org about SFP, and it's the literal same framework as Johnson has put out. I get the feeling that it's not used a lot, or at least that there is not a whole lot of iteration happening in terms of "what is a science fiction prototype?"

My wrists still hurt, need to call the doctor

Made a trash barrel for the cyborg, for picking up trash. This again feels like a mundane job for a cyborg, but it should have a grounding effect for the reader and emphasize the fact that the cyborgs are there to protect, help and clean the ocean after what we've done to them.

6.9.2022

Took a break.

Thinking and designing the communications drone. The drone should serve multiple purposes, like providing the cyborgs sensory data from its more powerful cameras and other sensors. In addition to communication, the drone should also keep the cyborgs maps and topology data updated. It would act more like a communication and information hub for the group.

Again I found myself thinking if this drone is too much information, too much detail, but in the end I made it a bit more detailed, a bit more believable. taking inspiration from existing underwater drones and extrapolating from there I made something that, again, bridges the gap between humans of now and the cyborgs of my SFP.

Hard SciFi usually goes to lengths in trying to ground their worlds into our reality. In that genre things like space ship engines are explained, the physics determined, so that it would be easier to immerse oneself into a fantastical world.

I'm getting more used to making a quick concept, modelling a workable model in 3D and drawing on top of it. Some models I've made should pass as final "drawings" with the detail and polish they have, but others I can draw on top of after the mock-up is made in 3D. That sort of a model I can now make with relative ease.

I have not really thought about the science-fiction prototype as a method in a long while. Not questioning my process makes it easier to move towards finishing the comic and then I'll reflect if I have succeeded in making a working SFP or not.

8.9.2022

Thinking about the diet and eating habits of these cyborgs.

Modelled a blue marlin, for the cyborg to race. Also as a natural reference of size and speed of the cyborg, even though there's going to be a scene with a scuba diver, but the

speed of a blue marlin is a natural way to convey that the cyborg is pretty fast in the sea.

18.9.2022

Apparently I took a break.

Continued finishing up the cyborg line art

3.10.2022

Finishing the cyborg model

4.10.2022

Rendering rough mock-ups (1) and placing them onto pages and into frames

5.10.2022

So I'm once again facing having to ask for an extension. Making this thesis, especially the comic, is and has taken a huge mental and even physical toll on top of having a 37.5 hour work week, every week.

vacation...I spent it mostly relaxing, if I recall correctly (could just check these notes)

I can see the finish, but if I would not have made this diary I would have forgotten why and how I'm doing this.

6.10.2022

Making more mock-up renders and putting them into comic page frames

8.10.2022

Technical things so I can use the same armatures with different scenes. One mock-up render.

Some thoughts into why I'm doing this...but maybe more about why I want to stick with a specific style for this comic prototype

9.10.2022

Setting up mock-ups. I was waiting for the need for new pages and here it is. Things I want to show don't fit in the mock-ups I already have drawn. This is fine, but might also mean that I'm not using the space I have efficiently. Do I care, or do I just try and get a working prototype done?

Got some proper framing done too, trying to understand how Shirow made his frames, but going for more dynamic shapes...which might backfire, but hey. Need to learn.

Feels good to get things moving.

10.10.2022

Making frames, inserting mock-ups into them, experimenting with composition, frame shapes, placement. There's a flow to comics and I'm a novice at this, so eh.

Had to calculate and find out about how much time I've spent doing this. With some assumptions and some time-keeping I can confidently say, that it's at least 300 hours. Which is fine.

12.10.2022

Attempting to compose the comic, checking my story points and comparing them to what pictures I've made.

16.10.2022

Making the mock-ups that were missing as per the story, storyboard.

Some pages that I originally sketched have been split into multiple pages. To me this makes the comic more readable, like how you can break up a written story through line ends and such. It affects the flow, clarity, pacing of the visual story as well as the written part.

It's all in the service of a good prototype

Cleaned up the cyborg 3D line art, getting closer to finishing this prototype. I have also been adding text into the comic with the mock-ups.

17.10.2022

Re-rendering the cleaned up cyborg line art.

18.10.2022

There is no human inflection point like Johnson wants there to be. There is none, because this is a post-human. A human does not make things better here, or even factor into the matter except in the ramifications of the technology.

This is a simplification, but I also think it's important to be able to deviate from a strict "this is how you make a story" as, at least how I see it, Johnson and his interviewees are truly and utterly American with their concepts of "story".

22.10.2022

Made the first rough comic into a PDF and sent it to supervisor

14.11.2022

Had the corona. Send emails to supervisors for feedback on the prototype

15.11.2022

Started doing the line art. Noticing a lack of detail in some 3D models might make it harder for me to focus on the final line art, so maybe adding a bit of detail to the base 3D would make that easier.

Now comes the part where I use my inking style and try to expand on it through Shirows style. Maybe that works, maybe it won't. Still really tired from the corona.

30.11.2022

Still no reply from supervisors, except that the supervisor changed.

Finishing the comic is what I need to do, so inking and making sure everything is good.

Inked the section showing the research building on the Worldbuilding-Worldintro page. Still figuring out how to consistently ink and shade the pictures, but I think I'm close to a good result looking at the Outro page and what I did today. It's a combination of the Shirow, 80's-90's monochrome style with the screentone shading replaced with shades of grey, then scratched like the screentones would have been. Also using gradients, as they we're able to get those done with screentones back then.

Screentones, with their patterns, get really weird when presenting them on a computer screen. I could never be sure if the viewer would have the images at a proper zoom level, and if not, the patterns could introduce a moire effect and just look horrible.

This is all technical, but when I consider the bigger picture of how the aesthetics can influence the delivery this becomes a relevant detail in my opinion.

3.12.2022

Still no word from supervisors. No matter, work continues. Inking and shading the pages, getting into the flow of things, trying to keep a consistent style.

6.12.2022

Time to reset the windows installation. 153 hours in Project Timer at this point.

8.12.2022

Back, lost some settings, TexStudio is going to be a pain to get back.

14.12.2022

Seeing AI art becoming a very hostile thing has sapped my interest in everything. Got to rise up.

17.1.2023

Back again, getting it done.

14.2.2023

Thought about focus group stuff

21.2.2023

Linearting the corals

22.2.2023

Still linearting the corals. Also some shading done on those

Thinking about the focus group and how to get the most useful conversations out of them. Maybe that's the wrong mindset, as it should be a natural situation where I'm not an active part of it.

Then thinking about really wanting the prototype to be finished. Everything linearted, shaded and text in place. I think providing anything less to the focus group would skew the results, as the questions will inevitably be about the prototype and not just some general idea of scifi prototyping.

Presenting a finished prototype should get a conversation that can evaluate a finished prototype, as simple as that sounds. Also, it would give me a chance to ask if the aesthetic choices elicit any thoughts from the group-

The way art communicates is subjective yes, but making images that try to be clear, universally understandable, could be something of a guideline when making prototypes like this.

Who knows? I should? I could?

1.3.2023

Line art, corals

2.3.2023

Finished the line art for the coral page.

My neck hurts, it's not an ergonomic pose I have when drawing on the tablet.

22.3.2023

Continuing line art

23.3.2023

Getting the big facility aerial panel line art done. Needed to make the model more detail, partly because I made the side view more detailed when I did the line art for that.

This has made me come closer to understanding that it's still not a linear process and using a model or whatever maquette as a background guide just ensures that the final image looks good faster. Use all the tools you can use to achieve a good end result and all that.

And be happy with what you can do.

12.7.2023

There's been actual writing in between the last entry and this. I did not put that into the diary, because it's not about the comic.

17.8.2023

Slow progress, focusing on getting the comic done. I have had to create some detail where there was none, to communicate better. Things like the cyborg being "tuned" with their back surgically opened, more biomechanical details in the fuel cell hatch.

Cohesion when it comes to world-building and also some visual detail that the reader could appreciate.

21.9.2023

Comic is done. Fucking finally. Last night before sending to print. No thanks to a month of flu and other problems.

C Focus group discussion plan

Here is the focus group discussion plan I made for the moderator. This has been edited to omit names.

Introduction. This and next two parts, 10 minutes of planned time:

- Introduction of moderator and note taker.
- Confirm that everyone is okay with the recording of this session
- In this focus group you will be given a comic to read, after which you'll be presented with questions about the comic to discuss
- The comic is part of note takers graduation thesis
- The main subject of the thesis is using the scifi prototyping method to design a posthuman.
- Posthuman in this context means a cyborg, cybernetic organism. In a more general way, it means a non-human, someone that comes after a human in our evolution.

Opening questions:

- Everyone should give a short answer. This is not a discussion question.
- What was the last sci-fi content you engaged with, if any?

Introductory question:

- How do you feel about designers being able to predict the future?

Group reads the comic. 5 minutes of planned time.

A set of key questions and their probes. 20 minutes planned time:

- How do you feel about the world depicted in the comic?
 - Does it feel like a possible future?
 - Does it feel possible without the cyborg?

- How do you feel about the details concerning the cyborgs function?
 - How the technology is depicted?
 - How the form of the cyborg is perceived?
- How do you feel about the details concerning the cyborgs life?
 - Compared to human life?
 - What kinda life does it feel like?

Then a set of closing questions was asked. 5 minutes planned time:

- What do you think about the overall believability of the whole thing?
- What would you maybe do differently with the comic?
 - In terms of technical execution?
 - In terms of worldbuilding?
- Is there anything else you would like to say about the comic?
- Thank you!