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Respondent: I was thinking, I mean, I didn't know how the meeting would go or whatnot, if there would be other people and such. I could give you a little backstory on that DWAM concept.

Interviewer: Yes. I would love that.

Respondent: It's what kept me going in these years that I've been in the US now. What happened was, the way it worked out is, let's see, I want to give you a pretty compact background. Many years ago my parents retired to central Arizona, where my father had designed and self-constructed with some help, an active/passive solar house. That was their retirement house. He was pretty forward thinking with that kind of stuff. He was an old military industrial analyst and engineer.

He ended his career at the White House in the Office of Telecommunications Policy. He was actually quite early on doing internet stuff as well, back in the '70s and late '60s. I would be going to this small town, off and on, visiting. I did help in the construction of the house and such. I would be going down to the small town and then both my sisters ended up moving there. One of them more recently and then the other one had been living there for a while.

So, I would visit this town and I would, between my European gigs, sometimes I would stay there for some months and started to meet some of the people living around there. Mostly through yoga classes, I'd meet people. This one friend that I made there, who was an urban designer from Cleveland, Ohio, he was in the process of building a straw bale structure for himself and his wife. His wife was a doctor or is a doctor out there.

So, I started working with him and learning a lot from him about different alternative construction. I've always been very interested in alternative construction stuff, alternative housing. We ended up becoming very close friends. One of his concepts and, to be honest, I don't know where he came up with this. It may be that he came up with it himself, this DWAM. Doing With Available Materials. The essential idea is that let's say you've come to a property, some house or something, some old falling down house. Maybe it's got some land or whatnot.

You simply start looking around the situation to see what materials are immediately available. Without purchase, not manufactured, not needing transportation. How you can reconfigure that stuff for rehabilitating the land and the property, the house, maybe, whatever.

The opportunity came up for me to buy a small house and property there. Actually, it was right next door to one of my sisters' houses. It's fairly high-density, small houses in a forest there. I bought this old cabin, it was built in the 1960s. Quite a small property, not very much. But there were lots of problems with the property and I needed- Well, so I simply started going through this DWAM process. Looking at things like, as simple as there was a lot of badly poured concrete around on the property. Just very thoughtlessly put down.

0:04:45 In that area of Arizona, it's technically a desert. Although it's up at 2,000m, so it's up fairly high, so it doesn't get quite as hot. But, you will typically have these very heavy rainstorms in the summer that can put down, let's see, a couple of centimetres of rain every 30 minutes or something. Really heavy, heavy rainstorms. So, rain, the idea of, first off, capturing rainwater for just drinking or using to water the property. That's one concept. Then just landscaping. You do this thing called water catchment landscaping, where you're slowing down the water flow, otherwise it would just go rushing through the property, tearing things down. The idea of water catchment landscaping.

I had some of these ideas. My friend, whose name is Todd, he taught me a lot about this stuff. There are some other references that I could send you regarding some of these design issues or design concepts, especially around the water catchment, which of course is quite important in the desert. I just started working with that concept. I ended up spending about, I had some money in the bank because of my parents passing away. I used that money to rehabilitate this whole house and property over about 2 years.

One example that I was saying was that there was all this bad concrete. What I did is, I took all of that stuff, made some huge piles of this concrete and then actually with, not a very big hammer, smashed that all into quite small, fist sized pieces. That I then used in the water catchment landscaping as a construction material to allow for drainage and building some rock walls and so on, from there on the property.

Yes. I did that for a couple years. I was actually able to pay off the house. I now rent it, down there in Arizona. Just recently, actually last Fall, because I've been working remotely, pretty close to urban Denver on the Eastern side of Colorado. Quite crowded, really not very nice. Well, it's a beautiful environment,

but too many people. My girlfriend moved to this house to a place in Western Colorado, so I decided I would look at properties near her house to see what was there.

I just bought this old ranch in a pretty interesting area of Colorado, where there's actually quite a bit of fruit trees growing and vineyards, which is quite unusual for Western US. There are some water sources. There's a large mesa that is just 20-minute drive here, it's up at 3,800m and that catches a lot of snow.

Interviewer: A mesa is like a flat mountain, is that it?

Respondent: Yes, that's right. Yes. Flat top. It's supposedly the largest flat-top mountain in the world. It's quite large. It used to have glaciers on it, prehistorically. It gets maybe 3m/4m of snow every winter. There are systems of irrigation that come off of there. I have some cooperative shares in some of that water. I have a fairly large property. I've forgotten what the conversion to hectares is, but I think it's about 4 hectares, 5 hectares. So, not small.

Interviewer: Five hundred thousand square meters, is that it? I'm not- Yes.

Respondent: Yes. Well, yes, it's a fairly large property. It used to be an apple orchard for many years. It's been settled by, at least the white settlers have been here for about 120 years. Before that it was the Ute Indians whose land it was. I just have started doing that DWAM process here. There's all kinds of garbage

on the property left from these farming and the ranching activities. Wood and iron stuff and this and that.

0:10:02 Yes, I guess that's probably enough to just give you some kind of background in that DWAM concept. Of course, it can apply in hundreds of situations. I'm an engineer, a former engineer, and the idea of taking a situation and looking at it as an engineer to optimise what you have. To figure out an energy flow through the system and try to figure out what the best thing is to do in that situation to optimise in a good way, not in that straight up engineering way. But in a sustainable, maybe regenerative design situation.

Yes. That's what I'm doing these days. Of course, I'm working fulltime so I don't have much energy and time, and then now I'm sick, so it's makes that much more difficult. But that's a general quick intro on it.

Interviewer: Nice. The house in this property is ready, is it usable or do you still need to do stuff?

Respondent: Yes. I'm living in it. This is my studio. It's about, let's see, I think it's 120 square meters. In American standards, that's a tiny house, essentially. Very tiny.

Interviewer: I can tell.

Respondent: My girlfriend's house is 4,000 square meters. Or 400, sorry, 400 square meters. It's like, oh my God, it's crazy. Yes, it's livable. It's complicated. The basic foundation of the house is more than 100 years old. It uses some very old construction

techniques that an octave- Yes, they're not so great for long-term. It's survived 100 years, but then it's been built on with some other additions in the 1980s. So, more contemporary construction techniques.

It's got a good situation. If I implement some more solar, just passive solar. Of course here, this area is also considered desert. The sun shines maybe 300 days a year. I could also, if I had capital, I could go with some photovoltaics and so on, quite easily.

Interviewer: Can you sell back the energy that you generate?

Respondent: You can. It's quite complex in the US. Certainly, especially during the Trump regime. There are some local and state subsidies where you can get- But still putting in a full photovoltaic system would be at least 10,000 Euros, at the very least. That would be without battery storage or anything. Yes. The sell back, sometimes it's been quite good, but then the fossil fuel and other energy companies, most of all of that stuff is privatised. They don't want to pay people for feeding back into the system. They don't like that and so they fight it and they changed the conditions. They changed the payback rates and so on. Yes, it's kind of variable.

Interviewer: I imagine that varies a lot from region to region in the US. Depending on where you are, it can have a very interesting cooperative.

Respondent: Yes. And they do exist, cooperative. There are cooperative- Well even, I mean, technically like this irrigation water cooperative that I am part of, there's also I think my electricity, the original organisation was a full cooperative. They had, I think, 1 or 2 coal power plants. They don't have those anymore now. They actually don't have any power plants. They buy their electricity from some other organisations. This area was, and to a small degree is, coal production. There is quite a bit of coal here. Although, I think there's only one active coal mine left in Colorado, which there used to be hundreds.

0:15:18 The problem is this may change with the new regime. Maybe there will be federal subsidies and things coming in. Actually, it certainly sounds like there will be massive changes.

Interviewer: Yes. Investment in [___0:15:45].

Respondent: Yes. That’s cool.

Interviewer: The green new deal under disguise.

Respondent: Yes. It's complicated. I don't know if you remember, but I used to work in big oil. I was an explorationist with a major oil company. My undergraduate was in geophysics. I worked for a major, back in the early ‘80s for 2 or 3 years, right when I got out of school. And then I was like, “Nope, I can't deal with this anymore.” But they still have very powerful hands on a lot of the politicians.

Interviewer: Yes. Things will eventually change, but it will take a lot of fight.

Respondent: Yes.

Interviewer: I was interested to hear more about, because you said you are an engineer and you talked about taking a situation and looking to optimise what you have, and how that connects to DWAM. And particularly, how do you see the ability to evaluate, to assess what things can be reused. In some cases, things can be reused as they are. In other cases, they can be transformed into something or they can be changed. How do you see that relation? How do you imagine we could try to objectify those skills or to translate those skills into something that can be taught and eventually even replicated digitally?

Respondent: Yes. That's the core challenge. If I think about my mental process as I'm looking at things and going through things, clearly I got a lot of that worldview from my father. He was born in 1910 in Northern California, on a, actually a ranch not too dissimilar from where I'm living now. As an engineer, he had to fabricate things. One of his early jobs was working at MIT, developing radar during WWII. Engineering at that time was really about physical fabrication. Figuring out- Okay, there was some basic science there, but then they had to take that basic science and figure out how to fabricate things that had never been fabricated before, in a very big scale.

Of course, that included, part of the outgrowth of that was the concept, which I'm sure you're familiar with, the idea of systems thinking or systems operations analysis or systems analysis. My father, he was one of the founding members of

the, what's it called? The ORSA, Operations Research Association. I've forgotten what the acronym stands for, but basically operations research. His career developed as a systems thinker. Whatever he brought to that, he certainly passed on to me. Not directly, but very indirectly. Just how he saw the world.

0:20:05 This idea of holistic- Part of my dissertation was really related to this holistic approach to looking at the world. Probably the key concept which my father didn't ever articulate for sure. But I am maybe more experimental in my thinking. I'm just thinking in the moment. But the idea of looking at the world through the view that the world is a configuration of energy, not a bunch of physical materials.

This idea of holistic flows where you are looking at a situation and beginning to understand the flows of that situation. One of the, actually both of these houses that I've worked with, to give a specific example. It may sound very simple, but is quite crucial, that both of these houses had, how would I call it, high potential southern exposure on the house. Which told me, immediately, that I could rely on that southern exposure, basically, for free heating.

I've heard the statistic that, if all of the houses in the US were rotated to optimise their southern exposure for heating, that that would save the equivalent of all Saudi oil reserves in terms of heating. I don't know if that's true or not, but it makes sense. Very few people build their homes with a proper southern exposure, which even at northern latitudes makes a difference.

Interviewer: Yes. Yes. I learnt a lot about that in Scotland.

Respondent: Yes. Yes. That's like an example of this idea of looking at a holistic situation and just starting to recognise the flows that are moving through, the energy flows that are moving through that situation. It would include, what is the natural ecosystem? Does the present ecosystem have any relationship with the original natural one or has it been completely altered? What plants are growing? What animals happen to be on the property or in the situation? Of course, clearly, what's the weather like?

A lot of natural flows are obvious, but then, of course, there are human directed flows. Are you on grid or off grid? Is there internet access? Communication flows. Just beginning to make an appraisal of those many different things. It can be very subtle, small things but it can then also be major things like southern exposure. For me, one of the things that may be very tiny for other people, but the energy flow of excess light pollution out here is absolutely minimum.

There's one small village within a few kilometres and then nothing for another 50 kilometres. The nighttime sky here is just stunning. So, that energy flow for me is quite important to be able to watch the sky during the day and during the night.

Interviewer: Nice.

Respondent: I don't know if that directly affects, but I think systems thinking- I didn't really articulate systems thinking stuff until I did my dissertation, which was only a decade ago, down in Australia. I was aware of Lawrence Wiener and people like that. Cybernetics and have read a lot of that stuff, but hadn't really- Let’s see, I want to take some notes of things I have to send to you.

0:25:03 Yes. I just realised that systems thinking was a fairly powerful tool. I will say it's problematic. It did come out of the military industrial academic complex. Of course, my father was essentially dealing with war machines for much of his career, including the internet at the end. There is a problematic relationship with that view. I temper that systems thinking with thought models. For example, coming out of ‘The I Ching.’ I don't know if you're familiar with ‘The I Ching,’ the ‘Book of Changes’.

Interviewer: Yes. That’s great. Yes. Okay. Go on. I’ll tell you later.

Respondent: I find that certain Eastern worldviews, which are energy based in general, were far more powerful in serving as a framework to observe, obviously, these energy flows within one's environment. I sort of hybridised the systems thinking with thinking coming from a more Eastern energy-based perspective. Which includes everything from acupuncture to martial arts. I used to practice Aikido for some years and judo as well. A lot of the concepts in there are about energy flow and deflection and optimisation are much more developed than in systems thinking, in some ways.

Interviewer: Yes. It’s interesting. I’ve never made that connection. Yes, it’s cool. Just a very quick note. Last year I went to Brazil on my holidays. My family, my kids were in Sao Paolo and then I travelled to Portela to visit my father and my two grandmothers who are still alive and just got their COVID vaccines. Then I met my sisters at the park, 2 of my sisters.

One of them brought me, she told me, “You know, I stole this from you 18 years ago and I'm returning it.” It was my Portuguese copy of ‘The I Ching’. I thought that was meaningful in that there must be a reason that I got that back at that moment. And it made sense.

Respondent: Yes.

Interviewer: It was cool. Yes. Just a quick anecdote. From what I understand, you're not in an urban setting. Do you live near a community or are you isolated?

Respondent: It's quite interesting. The house itself is physically right in the middle. The property as is a rectangle, as many of them are in the US because of early surveying of land. My nearest neighbour is probably, well it's about maybe at least 150m, maybe actually more, probably 200m away. That's one sense of isolation. The town, which is nearby, is about 4 kilometres away, and that town has only 3,000 people. So, quite small.

The next largest town, which is about 40 kilometres, 50 kilometres away, is I think maybe 20,000. This is definitely a quite rural area. Before I bought this place and moved out in January, actually, I guess I actually moved. I bought it in September and then moved in January. I was living in fairly urban, suburban/urban situation. Renting apartments and stuff like that. But yes, this would definitely be rural.

0:30:04 For me, the principals don't really vary that much in terms of observing energy flows. I would say urban are perhaps somewhat more complex because of the number of human altered energy flows. Yes, of course, there are obvious

differences in the two situations, certainly what one's potentials are, possibilities. And then the relationship between the level of human altered flows, of course, is what a city is. A city is an agglomeration of human altered flows on a massive scale. You see it- Pretty much in the west of the US there are no, there's almost no natural, real natural landscapes.

There is the legendary or mythological western US landscape from the Marlboro man and all that kind of stuff. But as you travel across the landscape here I've learnt, because I do spend a fair amount of time when possible, and when physically able, walking in the back country. I've learnt to identify the level of human intervention in the landscape and it's dramatic. We actually have no idea what the natural landscape looked like here. Even if there ever was.

Humans have been here for whatever, 15,000/20,000 years and all the megafauna had been killed basically 20,000 years ago. There's long scale alterations. My job is at the Colorado Geological Survey. I work with a lot of geologists, hydrogeologists, working with groundwater. One of the things that I remember from my early education, but also I've been reminded of this concept of deep history.

Interviewer: Nice.

Respondent: Yes. Where, if I look at a landscape, I can begin to recognise the basis of this landscape is maybe there was an ocean here 40 million years ago. And this is what's left from that ocean deposits and so on. Having a view- It's quite interesting working with these geologists because they are able to walk into a landscape and start to look into that deep time and describe it to you. You begin to realise that there are these

massive flows of energy that take place over huge, huge time periods.

I just fold all that stuff into how to think about if I come into a new landscape, whether it's urban or wherever, you just start to look at that whole expanse of possibility, I think. Teaching this or passing it on to people or training people how to do that. Of course, I did a fair amount- The teaching I did when I was in Europe was around sort of sustainable creative practices. I think one of my conclusions is you can't teach it; you can only do it and then invite participants to do it with you. That's where the DIWO, Marc's DIWO concept, Do It With Others.

DIY, of course, those have been always very complimentary ideas. Of course, work like yours, where it was always, Do It With Others and bring a collective together and that collective energy.

0:34:57 I guess one of the things that was the most important for me is being around people, number 1, who I could learn from. Who were empathetic, sympathetic, who had a good vibe around them, who were willing to share. Then absorbing their knowledge and then going on to share that same knowledge.

Like this DWAM concept. It was something that maybe I naturally was doing beforehand, but here was someone who articulated it and had a much higher level of practice somehow. So learning, certainly learning from others. Obviously like the work, the indigenous work you were doing. Learning from the people who were really attached to the landscape is crucial.

Again, regardless of what that landscape is, whether it's in Brooklyn, New York or whether it's in the Amazon somewhere, you simply are listening, looking, absorbing, contemplating and

making sure that whatever you bring to it, you're not locked into because you may be totally wrong, somehow.

Interviewer: If we just change the direction a bit. I'd like to ask if you see this kind of a view that you, as the person who has this background with systems thinking, and there's this influence from your father. Your role in this system, as a being that is aware of the possibilities that identifies, perhaps, patterns or relates things that you see with things that you did in the past, or things that you see other people doing that are possible. And jumping to, if you could envision some kind of machine or technology that could play your role into a situation.

Where I'm coming from on this is that I'm trying to think of ways to use technology to increase the amount of materials that are reused, that are not thrown away to recycling, incineration or landfilling. What would be the abilities or the skill that you, as a being, an entity inside the system, apply to change it? How can you think of technologies that absorb not, but replicate some of these skills?

Respondent: The first thing that comes to my mind is quite simple, collective database. That’s an initial concept. Clearly some type of machine learning. Because essentially, a human knowledge base that is rooted in, say, long-term experience, you have the challenge of capturing that long-term experience.

I'm actually directly dealing with this. One of my good colleagues, he's a senior hydrogeologist here. He has this huge, 40-year knowledge of groundwater systems in Colorado, which are utterly crucial to any kind of system, sustainable system. Urban, suburban, anything, period. Survival of humans. He's leaving the job in July. In a way, I don't know

what to do. I'd love to take a brain dump of his brain and somehow capture it. Very often, we'll just have these spontaneous conversations and I walk away from the conversation just like, “Wow, I just learned so much from that knowledge base.”

0:40:03 The machine solution suggests that there has to be- Obviously, number 1, there has to be a human computer interface question, right. You've got this MeetSpace knowledge base. How do you get that over to the machine space? Again, I suppose the database was probably the most elemental of that, but of course, how do you make the database? Because the database is reductive and selective. What does the database do? Obviously, you actually have to interface back from the database to another human.

Again, I'm thinking in the moment, this may be total bullshit. Part of what I do with this organisation is try to capture knowledge from these people. Their major output are publications. They go out into the world, they look at things, they come to some scientific conclusion and then they write it up. Then we put that out to the public. Basic science research. But there is this question of, they're generating data, what to do with it, how to present it.

One of the key concepts, and this again is very elemental or maybe super basic, is metadata. This organisation has never been really concerned with metadata. A few of the former employees were careful about metadata. They generate machine data from recording devices. They generate field observations, text, video, audio, images, maybe. Probably not audio, but mostly photographs. Then, of course, they're writing about things.

If you are generating large quantities of that type of data, but you're not concerned about metadata, then that knowledge

database cannot propagate into the future because nobody knows what this data is if there's no metadata. That's been a quite crucial thing, is setting up metadata standards which that goes back to systems thinking. Systems thinking always used reductive tools to try to capture larger systems of flow.

Because, of course, the whole world, a human's experience in the world, is about reducing because you can't take it all. You've got to pick and choose what you're paying attention to. I think, figuring out what data to capture, how to capture it, applying metadata, and then, of course, the big question about how to get that back out to somebody. One of the things I thought of which, as an example of this, I don't know if you're familiar with the Appropedia Wikipedia project?

Interviewer: Yes. Yes.

Respondent: Appropedia, you know it?

Interviewer: Yes.

Respondent: Yes. Okay. I've met a couple of times, oh God, what's his name? The guy who started it. We've met in several different situations over the years. God, I'm so bad with names these days. Appropedia, there's an example of a collective knowledge base where people can go. But of course, how do you get people to Appropedia? Why would somebody want to go to Appropedia? You have to provide- Somehow you have to motivate people, which I guess is education, right. Learning.

I think facilitating situations, whether they are mediated by machine or just human encounter, direct human encounter, you have to- It's like the facilitation work that you've done and like I've done. Things like the [Pixa like 0:45:04] situations, or [Brico].

0:45:07 It's about this facilitating trusting conditions. Whether or not it's machine mediated, it's got to have a degree of trust. Where, if I'm coming to a database or some kind of machine mediated knowledge, I have to trust it. Trust, I don't know where the word trust and machine mediation fits. I haven't even thought about this. I have to trust that you are at the other end of this conversation, right, to have a conversation. Even though, at the level, we are highly mediated. Biotechnology, a military industrial technology.

Interviewer: I think that there are different aspects of trust in that sense. One of it is technical trust that this conversation is not being spied on. The other is trust that is very hard to quantify or to make objective. We've met before, we have a shared background experience and how that is also part of trust.

Respondent: I describe that kind of stuff in very fuzzy ways. Like my friendship with Tapio. That was like an instant meeting in 1994 at the Helsinki ISEA. I had seen him and Susanna give a presentation at ISEA. I was like, "Wow, that couple man, they are crazy dressed. What are they talking about?" But then when we first met face-to-face, it was instant. I describe it a lot as a vibe. You are open to some other and in that openness you see that that other is, I don't know, simpatico or whatever. That's the problem, it's not really, it's a very fuzzy space. It's not social science for sure.

I think a lot of that, a lot of the principles I used to teach about dialogue. Having my students engage each other in sustained two-hour dialogue exercises where they had to just face to face with a stranger and they had to figure it out. I observed how forcing them into those kinds of situations, say on a weekly basis, where they would have to have a different dialogue with another person in the group, these two-hour dialogues, that it created the conditions- Well, it created trust and it created the conditions where there would be this much higher level of flow between all the students.

I was not the Herr, Doctor, Professor. I was simply a participant in a situation. A creative situation where I was just, I facilitated some initial conditions and then stepped, not back, but just stepped into the situation myself and just participated.

Yes, setting up conditions of trust. Clearly, a technologic situation, in my view, is always heavily embedded in the human social techno. I always called it the techno social. In that one and had to be very aware of what the technology was doing to the human connection. Then, once you understand that, then you can say, “Okay. Well, if we only have the possibility of a text chat between you and I, this is what we can do with that.” It's not going to be sitting in a bar with a couple of beers for an afternoon, held on the sidewalk somewhere in Berlin. Maybe someday. It's a text chat and you can do something with that.

0:50:06 You just have to use what the mediated technology offers. In my view, there always was a sense of alienation with technological mediation of human contact, which we've been taught to suppress that alienation. Yes. I guess the direction of artificial intelligence is the obvious future direction to some of this. Although I am, personally, quite skeptical about how that

works, given how it's being implemented already on us. In very, very negative ways and manipulative ways.

I think any technological solution has to be deeply embedded in a techno social situation. That both have to be developed side-by-side or actually not side-by-side, just integrated completely. Which, that's open source, right?

Interviewer: Yes. That's one side of open source. There's another side of open source that is not at all interested in social aspects or ethics, ethical considerations. One point in which I think I had to walk a very fine line is precisely that connection of, how do you create a system in which technologies are shaped to gain trust from users? So that you can set up this, I don’t know, a mobile phone app that a person will point to something and find information about that object, and how repairable it is. That's one of the prototypes that I’m possibly working on.

Design it in a way that people trust it. But on the other hand, not use that to cheat people. In order to reach a point in which the interface or designed part of it, is trusted, my particular opinion is that I must make sure that the whole system is trustworthy. I cannot simulate something by using, I don’t know, cues to trust and then do something that is not trustworthy.

I guess the other side of it is something that you brought that I am interested in. Other social considerations brings me to another concern that I have is that I'm not willing to replace the work of people who have this very interesting skill. People who work in recycling, zero waste projects, that can identify the potential use of something. I don't want to replace the skill of those people. I would like to create place for that skill to be

augmented in their work, or to be replicated in places where there is no such a role.

This is some of the boundaries that I'm setting to my research. I don't want to step too much into the trust of the users of those systems. I want any kind of technological output or outcome of this project to serve the people who work in these kinds of settings, instead of making them disappear. The intermediating this kind of reuse situation. Yes. So, that's, I guess, part of my…

Respondent: Yes. I think there's a major break point at some level. I can maybe explain that in two examples. One of the first things that pops into my mind, I was at the university here. Because I'm actually an alumni of the university so I have some interns that I work with. I'm not teaching at all, but I enjoy- Because I was teaching so many years, I enjoy hanging out with the students when I can and stuff. I was helping out. They have a student club that was constructing a tiny house with alternative techniques and so on.

0:55:07 Most of those students, a large percentage of who were participating, were young women. Most of those young women have literally never picked up a machine or manual analogue tool before. It was always such, it was so fun for me to work with them and just show them how to use a saw. Just to see how they adapted to a tool, began to understand just an analogue tool. Like, how does this work? How can I use it? How can I not get injured? How does this process work?

There's a break point in my mind that goes from learning a tool like that, or let's just say, coming to trust a tool like that, trust your own abilities and that you're not going to get hurt by it or something. The break point where you shift from analogue to

digital. The digital space is so embedded in this massive globe spanning, techno social, military industrial machine, that the question of deploying an app that, unfortunately, that app has so many linkages to so many different dimensions of possible mistrustfulness.

When you were describing the app situation, I was only thinking if you had the app on its own device, its own device. And that device communicated with other devices like it only. If we wanted to talk networks or something. Yes, you would have to pull that device out of that huge infrastructure. So, somehow the linkages affect the level of trust that one can get to, I guess, somehow.

These days, I'm not sure that I- I stopped teaching actually in 2013. That was the last semester I taught in US higher education. And since I haven't been back in Europe, I haven't really taught because the learning situation here in the US is much more savage than in Europe. But one of the things I found in the learning situation was that the young people were terrified of any new idea. I was unable to, I couldn't get them to trust me, just as human to human.

I see part of our societal transition to, especially where we are now at, is that the level of trust is practically zero. At the same time you have all these people who are blindly trusting in Facebook and Google and Amazon and Apple. Yet, they can't trust their neighbour, their next-door neighbour. The challenge of dealing with that, I don't- I guess my personal opinion is, it can't be rooted in the technical. It can't be rooted in the mediated. It has to be rooted in, again, the work that I know that you've done on a community basis. The human face-to-face, down just dealing with another human being or a small group of humans.

0:59:54 Without having a root in that kind of situation, the technological is never a solution. But that's very much my opinion. I think, for me, there's always this huge leap, trying to think of in terms of that very basic human computer interface design, or GUI design, whatever. It’s like, you can think of design aspects of that interface, but that whole thing is embedded in the languages of power, the behind the scenes. The coding languages, the object-oriented programming things.

The whole, as we're understanding, the biases of artificial intelligence are incredibly bad. They're incredibly rooted in the power structure, the wider power structures of technology. It's very hard for me to imagine how to overcome that somehow or solve it.

Interviewer: Yes. I guess, my optimistic take would be to route technologies in counter-hegemonic ways. Thinking about sovereignty, technological sovereignty and all those things. Yes, I don't know exactly how to do that. Actually, there is this potential conflict with what I'm expected to develop in this research. There is some kind of bias towards, we should produce products. It’s not exactly because we are always reminded that it's a PhD, it's research, you’re not supposed-

I think even my own understanding of that sometimes goes into that direction and I have to, “Oh no, I don't need to develop a product.” But I can use technology to make people engage into situations and even understand what that system is that is underlying all those things. What I think I'll try to do is I have I have explored a bit, this idea of a database. I've called it the Universal Registry of Things. I'm working with something that would be, I would call it E/I. That is the Evaluating Interface or something like that.

I'm trying, possibly framing it as a workbench equipment that you could bring an object to it, and it would display information. I'm also exploring how to make that relatable. I want to make sure that it's not only a way to access information that is provided by manufacturers of objects, but that can also give access to stories of people who have reused different kinds of objects or materials. Bring all this collective conversation about the real value of things, or how can things be attributed a different value depending on the situation and your knowledge and access to tools and all of that.

Yes. Lots of interesting things that I'll pick up later and develop from what I've got from this.

Respondent: Yes. I think that's a really important point. The first thing I think of in that is, in these two situations that I have dealt with these two houses, I have, amongst other things, I've got a toolbox of my grandfather's. He used to build houses in the late 1800s in Northern California. I have this huge toolbox of every hand tool necessary to build a house. No power tools, nothing electric, just all hand tools.

Interviewer: Nice.

Respondent: But, of course, I also have a range of power tools and all different kinds of tools. So actually, one of the things that fits into this, let's say analysis, that's maybe not such a nice word about it. But I do analyse the situation when I'm thinking of things that I can repurpose or something.

1:05:07 I think of, number 1, I know the spectrum of tools that I have. I also know the spectrum of tools that I don't have. So, when I

look at an object, I can say, “Okay. I know that in 10 ways I can change that object.” Obviously, something as simple as a piece of wood, with a variety of tools, you can do a shitload of different things with a piece of wood.

Whereas, with a piece of steel that's a round piece that's several centimetres long or something, there's a whole other set of things that you can do with a given set of tools. So, making that linkage between the tool set that you have and the object you're interested in transforming. I guess, starting out thinking there, you can have a Venn diagram of what you can do with that material or what you can't do.

That could be, it's a little bit like having a sandbox where you have a set of tools and you give some children a shovel and a bucket and two or three different tools. The sand is their situation. They will figure out, what can you do with a bucket? Well, you can put sand in it, you can pour it on your friend. You can put it on your head. There's all these different solutions to the situation. I think, offering a tool set would be crucial for an app. Some kind of initial tool set that links operations on things with the potentials of the tools.

Because, of course, with that situation, there are some obvious things, there are some extremely creative potentials. But again, the mindset of the person coming to play with it, you have to have that situation. Well, maybe, I don't want to be too long winded about this, but I can give a little anecdote. The daughter of a friend of mine, an old friend of mine, he and his wife, they're both engineers. The wife is extremely dominant and controlling with raising her children. They never, almost never, had open playtime.

As they were growing up, I would always be pointing this out. Like, “Look, I'm an educator. You don't have to trust me on that, but open, unstructured playtime, without anyone telling

anybody else what to do, is incredibly important for a child's development. I finally had to break off my connection with this couple. I'm still in contact with their children because I was a person in their lives. They're now in their twenties.

It's crushing the effects of control on people in terms of their creative potentials. The idea of having a toolbox, but having it in an open situation, just a real open situation, I think is crucial.

Interviewer: Yes. Allowing people to use the toolbox, not only to solve specific problems, but also to create and to play and experiment and to make mistakes and spend waste materials. This is also part of it.

Respondent: Yes. Yes. I think, probably my formative situation in regard to my father, when I was growing up, he had a very well-equipped workshop. It was not very large, but he had a huge range of tools.

1:10:02 I would maybe work with- He would ask me to, sometimes it was not very nice working with him because he was so specific about things. I would have to follow directions. “You're helping me work on the car. So, hand me a screwdriver, hand me, give me this.” And it would be cold outside and be like, “Fuck, I want to go inside,” whatever.

But then, on the other hand, I pretty much, I had free access to that workshop. The only control was that if I used a tool, it had to go back where it came from when I was done. For me, the possibility of just having a lot of machine tools, a lot of hand tools, a lot of stuff. I would just build stuff and make things and whatever, with nobody else around. My father trusted me at different levels of which, obviously when I was really small, I

couldn't use the big power saw and things like that because it's just too dangerous.

But he basically let me- But, of course, if I did not get the tool back in the right place, then I was in trouble. That was just something that, when you have a tool set, if it's not organised, then it becomes far less productive.

Interviewer: Yes. Yes. Over time it can get useless and you'll have to spend the whole day just putting things back on. Yes.

Respondent: That actually goes back to the concept of my struggle with this metadata issue. In a database, metadata is the way of organising the toolset or the database or the knowledge base is keywording, tagging, categorising and attaching categoric metadata to things. Keywording, just to comment on that for a second, keywording, was a core principle in systems thinking. It's a way of reducing a larger knowledge set to something that you can quickly, prototype is not quite the right word. You can sort of prototype; you can try things out.

If you know a general span of what something is working for, or what something relates to, like a relatable, what do they call it, a related database. Keywording actually, when I started with this organisation, they, of course, had nothing. They didn't know anything about this and their data space was total chaos. Many, many terabytes of total chaos. One of the first things I did when I got to the organisation was, I made a keyword cloud of around 300 to 400 words that tried to capture everything that they did.

Of course, you could add thousands of things to make it more accurate, but obviously you need something that's

manageable. That was one of the first things I did. I looked around the organisation. I talked to people. I read historical publications. I just looked through the database or the data, basically their servers and stuff like that, I started looking through. What's this? What can we call that? So, I generated this keyword system that then I could apply that set of words to any data object in the entire space.

Interviewer: That's interesting.

Respondent: That would allow me to, relatively rapidly, move through an information space and gather information that I needed at the moment. It takes time and energy to do that. It's never ending practically, but it actually then raises the value of that data space. The more chaotic the data space, the less valuable it is in terms of working on it with different tools or something.

1:14:54

Interviewer: That’s great. Yes, that's interesting. That's also good insight. One of the challenges I see when trying to create a database of virtually every potential use for a secondhand object, is that there is a lot of information, but it's totally scattered in different kinds. There are very structured databases and there are very trustworthy data sources.

For instance, iFixit have this very interesting database of- I don't know if it's really organised as, technically, a database. But it's a resource with lots of information about how to repair stuff and what tools are needed for that. But then, how do you connect that to, I don’t know, a database about how to reuse clothes or furniture?

In this case, even that idea of metadata and, I guess, to draw inspiration from the way libraries exchange information. Even if every library system have their own way to organise things, they have this metadata schemes and Dublin Core and so on.

Respondent: Right.

Interviewer: I think this is something that can be useful. That aspect that any kind of approach to create a database that that organises information of how to reuse stuff, will never be finished by definition because it's impossible to reach an endpoint.

Respondent: Yes. Well, that's an important point. That's an important point because, yes, the concept of reduction is one expression of that. The more information you have, it's the map and the territory. The map is never the territory. If your database is so large and so detailed, then you will spend all your energy maintaining it, and that's it. You will never get around to fixing that broken chair that you've got in the corner. So, number 1, it has to be reductive, so it will never show all solutions.

Of course, this gets back to your original question. How do you get solutions to people or or situations where people can solve different things? How do you do that? I think that just goes back to, again, you have a tool set, you've got a play place and you let people do it. I think, because I was able to do that as a child, just play, that just made a simple segue to being as an adult and just like looking at stuff. I also, obviously I've got input from other thinkers and such. People who are, well, just the whole concept of sustainability or regenerative design.

Of course, there's huge quantities of written material and visual material about all of that stuff. But the basic thing is, is providing a play place where someone can pick up a tool. I don't know, I'm again, just stream of consciousness here. I can imagine, one picks up a tool and immediately, maybe in a virtual reality situation, a set of pop-up windows come up saying like, “You can do this with this,” or “What about this?” or “Look at this thing.” Just, not providing solutions, but providing maybe directions, open directions.

It's like, what do they say in open source where you have a solid software platform that's been developed over time- The idea of forking it. You suddenly fork this thing over. That same thing, that same process, I think is the idea of when someone hands you a tool. Oh, this is the normal use, what this thing was designed for over a 100 years. But can you use it this way? Yes, the idea of forking, that's interesting.

1:20:02

Interviewer: Yes. I think there's also one, this idea of facilitating and creating a play place. I think, perhaps what I can do in my PhD is, not necessarily to develop this database, but to create a standard or a protocol for what would be information that is relevant for that. And then encourage people in different kinds of organisations, and local organisations in different countries working with zero waste projects, to share information and provide their own information based on that. I guess that would be a simpler technical way, even if it's incomplete. But, by definition, it will never be complete. So maybe that's a good way to…

Respondent: Yes, exactly. The idea of, setting up a situation like that and then having some, how do I describe it? Well, basically,

feedback. You have the feedback loop where people share their stories. Like, I took the tool and this is what I did with it. I totally fucked this whole situation up, but this is my story. Having people see- Again, okay, just thinking in the moment. You pick up a tool and these windows pop up. Here's a usage, but then also here's a story about how somebody else used it and it worked, or it didn't work, or something like that.

I think, clearly, the question of the control of the environment that everything is taking place in is crucial. If you have too much control, you don't get play. You just get robotic activity. If you don't have play- This was the point when I would be doing, say a two-week workshop, I would start as Herr, Doctor, Professor. Walk in the first day, all the students are sitting proper and everything. I'm standing up in the front and I'm writing things on the white board and telling them things and whatever.

What I would try to do is devolve my position within about four days so that I'm sitting around the table when they come in. I'm just hanging out and then maybe at some point I'll say, “So what do you want to do today?” There would be this crucial point in those workshops where some people would get crazy angry with me because they were not being told what to do. Then I would have to, I would try to explain, “Well, this is part of the creative process is to decide what to do.”

It’s related to, I never pronounce his name, right, but Frayer’s facilitation work. His position about control of situations was to not control the situation. He would facilitate a big space, a conceptual space, and then just play with everybody in that space and participate.

Interviewer: And education would happen there. Exactly.

Respondent: Yes. That's where people learn how to use the tools in creative ways. The sliding scale of control is quite crucial.

Interviewer: Yes. Cool. We've been talking for about two hours.

Respondent: Yes. Yes. It's been really great to catch up. I'll follow whatever is going on and participate when I can. This is a fairly good time for me. The earlier things, of course, are too early in the morning. This was 10 o'clock in the morning, that was good for me. If there are other times I can try to jump in and whatever. So you can just, I don't know, just keep me posted on everything.

Interviewer: Yes. I'll post some other things. I'm summarising some other previous parts of my research. I'll try to describe a bit more and work with everyone who was involved in these two ideas. The database, and this interfacing approach. Be it an app or a machine or something else.

Respondent: Cool.

1:25:03

Interviewer: But yes, that's- I've made lots of notes here on the mirror board, hundreds of post-it notes.

Respondent: It's so nice to catch up and it was great to see you again. God, time goes by so quickly now that we have to take advantage of

every possibility because time is just racing. Alright. Well, I guess, see you next week at some point then.

Interviewer: Yes. Yes. I will write...

Respondent: Okay.

Interviewer: Did you get the email, the group email, [Write 1:25:40]? Because it's another Microsoft thing that I'm not used to and it's kind of weird.

Respondent: It is what it is.

Interviewer: Yes. Okay.

Respondent: I'm typically on Telegram as well, too, most of the time with my son and some other people. I look at Telegram and stuff, so that's a good… Yes.

Interviewer: Yes. I guess we'll coordinate mainly through Telegram in the main list. Cool. Thanks again.

Respondent: Alright. I'm going to go have some lunch. It's a nice day out here. It's about 18 degrees, I think. Springtime is coming and the sun shining.

Interviewer: Yes. Yes. That's good. This morning was sunny, but 3 degrees.

Respondent: Oh. Ouch.

Interviewer: Yes. I went out with my bike, but then it was not that warm.

Respondent: Yes. Cool.

Interviewer: Okay. Talk to you soon. Thanks.

Respondent: Okay. Take care. Yes. Take care now.

Interviewer: Bye.

END AUDIO