Facilitator:	Welcome everyone and thanks for joining this call, this session. I don't know to what extent you've been following the emails and messages and invites and videos that I've been posting. I'm in hyper documentation mode.
	We have had some interesting conversations throughout last week and I also managed to start to organise the documentation about the sessions and what I plan to do in the coming weeks. I know that some of you have already replied to the Doodle poll asking what is the best time for you to present or introduce or propose a discussion next week about things that you've been involved with.
	Maybe we could just start today with a quick round of introductions. That's three of us now. Hi, I'm Felipe Fonseca, originally from Brazil, been living abroad since 2019 when I started my PhD research, first, initially in Dundee in Scotland, then the whole project moved to Northumbria in Newcastle in England. Now I've been in Berlin since September and I'm glad to say that this afternoon is finally sunny.
	I still have another year or so before I finish my research and I hope to be able to by the end of this semester come up with co-designed prototypes related to the re-user materials in cities, particularly smart city projects but I'm not that much interested in that as you may be aware.
	I would ask, I don't know, Mary, can you introduce yourself?
Female:	Yes, hi everybody, I'm Mary. I live here in San Francisco in California. Have been living here for a number of years but I was born and raised in Ireland. And for a number of years working in corporate finance world. A few years ago I decided to venture into my own thing which was in the resale area.

Can everybody hear me?

Facilitator:	There is some echo on this side.

Male:	Keep going.

Facilitator:	We can hear you.

Female:	Perfect. I heard something so I was just checking. So I was working on a start-up in, as I said, the resale business and what we had with a lot our research had figured out that ownership was a big criteria when it came to decisions of buying and selling. We would also look at communities and small businesses and help them be part of the resale economy as well.

So we were ready to actually launch a pilot programme last March and we had 4 businesses lined up and they all had to close due to restrictions. So like any of these ventures you go into there's always a little bit of risk and that was one of those risks. It was kind of, "Where did this come from?"

Anyway, we put everything on hold and given that the retail world was involved in this and retailers, given the pandemic we have just come out of, is changing quite a bit where we're trying to re-evaluate what we in the next pivot.

Sorry, long story there, but that's interested in re-use. That's personally where I got with re-purposing things that I have personally with other people, that sort of thing. That's why I'm here. I was introduced, Felipe, to this by- she might be the only

other person from the States, Kamie, I don't know if you've spoken personally with her. Kamie helped me in my project when we were doing it. She advised me in certain amount of the design and the technical aspect.

So thanks everybody.

Facilitator: Nice. If you have a website or anything you want to share, please post it to the chat.

Female: Yes, I will. Now the chat, which is the best place to post?

Facilitator: That's the question we have these days. You can use this chat here or the Telegram group or the email discussion I'll be watching everyone.

Female: I'll probably put it in the email. Yes, I'll figure that out. I apologise, I didn't use Telegram. It hasn't got the best reputation over here and actually I've got so many other stuff. I use Slack a lot and I was a little few days later. Sorry, I apologise, I didn't get- I know you gave everyone a choice and I wasn't involved in that. So I apologise. It'll probably be email.

Facilitator: Yes, no problem.

Female: Thank you.

Male:	Hello everyone. It's a great, great pleasure to be here. I'm a design researcher, trained in industrial design. I use a few titles, service designer also, but basically trying to make services that work, especially from the perspective of the person using them, but a lot of that work is very hard to find in the spaces of making or repair or maintenance.
	So, as of September I've tried to redirect my practice towards that a little more specifically and using some of my other background to help in that, namely, the use of virtual tools, so video games. We're also experimenting in Miro and speculative design to make maintenance and repair more common part of our day to day dreaming and futures thinking and all that.
	So it's open-ended ongoing investigation that's in part happening on a Discord server called Cyber Local Strategies which I collected also. It's also a common thread across a lot of the workshops that I run.
	I have yet to find an opportunity or to hear of an opportunity like yours, Felipe, to sit down and really spend some time with this topic. I'm really excited to be able to participate in this and just meet more people who are in this space who are interested in this topic. I can leave my website in the chat here at least for now.
Facilitator:	Cool, thanks. Mark, I know you have introduced yourself last Friday but can you do a quick version?
Male:	Yes, sure, I'll do a quickie. My background is originally an engineer very long time ago. Worked for a major life science pharmaceuticals company for years and years. Left about 10

years ago. Did a PhD looking at innovation ecosystems. So I'm really into taking systems perspectives on things and taking a, sort of, multi-perspective view on how we solve problems. I actually still work with a number of start-ups. I currently work with 3 for my sins that are in all sorts of weird and wonderful fields in and around life sciences. One of them is looking at completely different ways of making vaccines. Another one is looking at making the whole PCR testing more sustainable and the other one is looking at AI technologies in diagnosis.

When I'm not doing that I do documentary photography and my focus for probably nearly 5 years now has been actually a project which has a working title of 'Unbroken' and it looks at repair and reuse. I've explored that in lots of different places. From places where it's part of the culture i.e. Cuba, Accra in Ghana but I've also been to places where the cities have taken a much more proactive view. So places like Helsinki, Eskilstuna in Sweden. Then I've just literally looked at stuff here, there and everywhere.

I've worked with a re-start project in London and shoot a lot of their events when I'm allowed to. In fact Janice has been on to me today about something which I need to follow up with. I'm hoping to actually start photographing a few more community events in the next few weeks. My website, if I spelt it correctly, I know Hugo has seen this before, is there. That's me.

Facilitator: Cool, thanks. I know Fred has popped up here but he apparently logged out. I was interested to have his presence but I'll chase him up some other time.

Fred is organising an exhibition and a series of seminars about repair in these coming months, so that could be interesting.

Male: Where is he based?

Facilitator: He's in Brazil but actually it's a cooperation, I think I can share because I'm somehow part of that project as well. It's a cooperation with a project in India and someone in the UK, Repair Acts that you may be familiar with. No, okay.

Male: I don't recall it.

Facilitator: Some kind of relationship with Restart. One thing I asked, and I think it's something that we can possibly work a bit more, is these kind of descriptions about how materials circulate. Whether where you are or in places that you are familiar with or in places that you have learned about and would want to replicate. I just wanted to open with this kind of discussion.

If you have some interesting experience about how materials circulate or get reused in your place. I can start by sharing two of the things that I'm probably sharing next week. One of them is an interview with the person who runs a cooperative in Brazil.

Brazil has this built- as I know these things from a close perspective, I would say that it's somehow fictional, but there is this interesting reputation of Brazil when it comes to recycling, particularly metals and aluminium cans and there is this involvement of waste collectors that we call [Catadores 00:18:04]. And there has been some interesting projects taking place there.

What I'm doing is interviewing a person who runs a cooperative in the small city I used to live in. I wanted to bring

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this perspective that even though the amount of aluminium that is recycled in Brazil is comparatively high, if you compare it to other places in the world, it's actually a win for the industry, but the people who work on that, they have a very precarious every day and they don't have access to equipment. They don't have access to protective equipment and their wages are very low.

I wanted to bring this different perspective because I've seen this scenario depicted in a very positive way time and again and this is something that I want to do for the next week.

The other thing, I don't know, Hugo, is your name French by any chance?

Male: Yes.

Facilitator: Maybe you can help me with that. I was expecting to have someone from Nantes here, from Ping Base or Ping. I found this description- actually I found in the second-hand ecosystem in Nantes this very interesting professional role that is the Agent Valoriste and there is this training programme for the person whose job is to evaluate the potential re-usability of materials and objects.

I want to interview that person. So I'll be sending an email- actually I have already booked to send an email to that person but hopefully they can send me some materials already in French which I'm very far from being fluent in. I think there may be some clues in that to what I intend to do, that is to identify what kinds of skills are involved in reusing and taking a socially benefit perspective about materials that are in excess or discarded.

So this is what I am planning to do in the next couple of days and what I would want to start the discussion is with these kinds of systems that you see in place. So one of them is- the two that I'm trying to find more about this week is this- the Catadores in Brazil and the Valoriste in Nantes. So maybe you can share experiences you have in your places or others.

Male: Is the idea that we take 10 minutes to paste things in the middle or are we going one by one to share those references? How were you thinking of doing it?

Facilitator: I don't know, we can decide among ourselves here. What do you prefer, what do you suggest?

Female: I can- sorry, I didn't want to interrupt. I can just give you a quick idea what goes on here where I live right now if that's okay. It's probably not dissimilar given to any pretty well developed city. I think it answers some questions you wanted us to address, so hopefully this answers some of it. So in terms of donations, you get a lot of them randomly left on the side street but more and more, less of that. I think you also wanted to check and see if they were in a particular place all the time. Sometimes, but, again, not very organised in that. It's just somebody moving that type of stuff. So there's no great organised-

What is most popular here, and again, because of the pandemic, things have shifted quite a bit, due to people living at home and getting rid of what's in their houses. Also people out of work, so you have this shift happening now where the

needs is greater in some areas than it was a couple of years ago or a year ago.

So what we have is the usual doorstep pick up which would be by the government which we pay taxes for. One of the big companies that do that here, in fact, it's a monopoly in many ways, is Recology. They are around the country. I actually was on their dump site over the weekend. You can go down there for stuff that other people, like, electrical that is gone beyond repair.

The other thing is consignment is very, very popular here in both clothing and in furniture, household items, that sort of thing both brick and mortar- I assume that expression is known was in actual retail outlets and online. More and more, there is the combination of online obviously and offline as in retail outlets and people using to search for items and that.

With the brick and mortar, obviously drop off is the preferred when you're in the city because you don't have to deal with the cumbersomeness of mailing and that type of stuff.

Examples of, say, from the clothing is there's a small chain here called Crossroads Clothing Chain. It's called Crossroads Trading, that's right. It's a small group of independent stores. So you have everything from that to somebody working in small businesses doing that.

Then online resale is very, very popular here. What's happening with a lot of these is where there maybe national or international, the actual site, they also are realising that they need to open either brick and mortar as well, again for the ease of access. And a lot of these- it's all about keeping their stocks up, so trying to make it easier for the actual consumer.

So there's a combination of everything but because we're beside Silicon Valley, there's I guess the online, offline, the

use of mobiles and all that sort of thing is pretty common use to get into that business or to recycle.

Sorry, I don't know if that answered any of your questions. I'm happy to give you examples of all of those things that I mentioned. For example, furniture, popular local one is Cherish. Clothing, popular local one is The Real Reel. You may have heard of those.

Another thing that's becoming really, really popular here is online communities. That has been the case for a long time but companies, like, Nextdoor.com which, again, they added a lot of users during the pandemic because of the idea of getting to know your neighbour, that type of thing. And because of the localised notion of being able to donate through that and at the same time know where your items are going and having that relationship.

Sorry if I went on a bit there.

Facilitator: No problem. Any other contributions for that? I haven't come across these specific names but I think there is this trend of more localised and community and sharing in small shops. I think I have already mentioned that at some point but I recently listened to the audio version of a book by Adam Minter called 'Second Hand', that is very interesting that covers some different perspectives on where things are being sold or where they are sent to. He talks a lot about this network, I'm trying to remember the name. This chain of thrift stores in the US, I don't remember the name.

Female: I think it was Goodwill.

Facilitator:	Goodwill, exactly.
Female:	I think Goodwill was the name of the one he was talking about. That was really good. I have to say I went really quickly through it, so I didn't read it in depth. He did the radio talk show scene here as well.
Facilitator:	Nice. I have seen some of his interviews also and his presentations. Actually he has this presentation he did at 'iFixit', that was very call it. I was always wondering about this what I'm tentatively calling Recirculation and how that could be folded back with access to equipment, access to skills to transform things. So not only make things circulate to people who need or who want them but also allow these things to be transformed or upcycled along the way.

Sorry, Hugo, do you have any story to share or local systems that you are aware of? |
| Male: | I have a few scattered ones though. So I'll find some better references. So right now I'm in the Netherlands in Eindhoven. I just moved here since September and it's interesting to see how mature the second-hand market is here with the amount of students. Eindhoven has two really big schools, TUE which is mostly an engineering school and DA, Design Academy Eindhoven.

We have a lot of recirculation of goods, Market Platz is one of the [___ 00:29:58] type second-hand store that I think is just interesting. Some of the bigger ones are definitely I think bicycles, especially being in the Netherlands, and furniture. |

There are some interesting things there, I mean just in the maturity of and just the sheer volume, rather than maturity, I don't know that it's a thriving business but there's a big volume. When I compare that, I studied and lived in LA for a good amount of time, I was there about 7 years and finding a second-hand bike repair spot that wasn't trying to sell you a $1,000 bike. You had 3 across LA and it was just definitely luxury for the local zip code of the neighbourhood but it was not something that you could depend on as a city.

I thought that was really refreshing and reassuring to have this here in the city and knowing that it's small also. Another one, I mean there are some interesting places also that I've been looking into, mostly that are working with circulatory and renovation and repair at the level of built environment, but I'm guessing that's going to be less relevant to you. Let me know if you want those and I can paste them but otherwise I won't go over it.

Another one that I just pasted in Miro was a talk Ikea gave recently. The head of sustainability gave at a place nearby called [Gazirne 00:31:37] on their innovations around circulatory and their products and they're trying to reuse the foam and revaluate it inside the mattresses and try to find- it's interesting to see them because of the platform they have but also how slow they are in adopting it consciously rather and trying to find ways still palatable to their customers in this mass revaluing of goods. So they're using the foam but it's hidden in the mattress, so unless you care you don't really know and that's good.

I thought that was an interesting thing. Then maybe one last one I wanted to bring up, and I think I've also put it in the middle. Let me just check. No, I haven't. The third link is this and this is some work that I did while at Quicksand. So Work

Space 10, I don't know if you're familiar with Space 10 but they're Ikea's R&D hipster, cool, rethinking the city arm and they have a really strong editorial arm and also they have some money to do these one off projects.

My team was tasked with looking at solar energy on the edge of the grid. So people who are depending on solar energy when the government or the central grid was not reaching their homes. We went to Peru, Indonesia, a couple of places in India and Kenya.

What was really interesting was that repair was not a main tool but it was really interesting to see that in a lot of their context that definitely had limited means. Repair was still a very last minute resort and we saw repair around these- I mean there are many things to say about repair, one that was amazing was that in India solar panels were adopted because they were much safer to manipulate and repair by hand. So you would not get shocked. You knew that kids could mess with them and be fine. So that was a whole insight and thing we explored.

In general in Peru we saw that there was a lot of hand me down and second-hand losing value also. So if you are at the bottom of the family ladder or earning less you are the one who would end up with the broken wire and you held on to that lamp hoping that one day you'd find someone to fix it, if you couldn't do it yourself. So it was interesting to see there that the whole thing of convenience and repair was still present.

These are not generalisations at all, they're just anecdotes but in the report you might find some stuff. I'll pause here.

Facilitator: I'd be interested to learn more about solar panel repair and how people learn about it. Actually one thing I did not ask

before, Mark, when you were introducing yourself, again, because you mentioned something about your work with start-ups and PCR testing and everything. A friend asked me this week about how is the maintenance of all those machines that are being deployed everywhere in the world? If there is any concern by the industry to take care of that or if it's just another case of proprietary technology being spread and disseminated quickly throughout the world with no care about maintenance.

Maybe this is another discussion to have.

Male: I'm sure it will be. I mean we don't make the actual test equipment. What we do is we stabilise the reagents that that kit uses. Most of the biological reagents that are used in PCR have to be stored typically at minus 30 otherwise they go off. We've got a technology, it's really simple, we freeze dry it but how you freeze dry is absolutely critical. And that gives these things 2 years shelf life and it means that you don't need to have an expensive colt chain to actually ship these things around the world.

The advantage of this is you can actually deploy these technologies in places, like, the global south [___ 00:36:10] to do if you had to rely on the kit. I think your point is a valid one. I think some work I did with the Restock project, I'm looking with what's happening with ventilators and the ability to repair them and knowing what happens in the PCR industry, it's all proprietary kit, they're proprietary tests. They actually even make the consumables proprietary. So when we ever do work for any of these companies, we often have to find ways of getting what is in essence a fairly standard set of reagents. But we have to get them into to bespoke plastic ware because what they do is they design the consumables to work only in their machine.

Sometimes they do that with- to be fair some of it's done to try and improve the performance but I think more often than not it's like the same as the guys using with mobile phones and bloody connectors and everything else. It's just a way of maintaining their little ecosystem to be very, very hard for anybody else to break into.

There's no question, most of these manufacturers that supply the hardware they are looking to completely control the entire supply chain including [___ 00:37:27]. The only way you can ever get these machines repaired is with a service contract with the original manufacturer.

A little bit of that from my previous background and that is still true.

Have I got any other stories to add? I'm not sure I've got a huge amount to add above what we discussed before, Felipe. As I said, my experience of places, like, Accra, Agbogbloshi in Ghana and Havana is the- virtually everything there gets reused in some way, shape or form. They will either repair it which is the first approach or they will strip it and scavenge it for spare parts which can then be used to repair other goods and then they will recycle whatever's left.

So there's far less waste on those communities. I mean the biggest problem, both those communities then have is when it gets to a true end of life, they have no- they want to have limited recycling plants and they're often using uncontrolled recycling methods and then the other issue of course is that actually they don't really have anywhere that's sensible to then dispose of the end waste. So they create other problems.

At least what they're trying to do is deal with the fundamental issue which is keeping stuff going out of the waste stream by

either repairing it and continuing to recycle or scavenging it and then the last resort is recycle and finally dispose.

As I said to you before, when I go and have a look what's happening in places like the Kierrätyskeskus in Helsinki, the model's essentially very, very similar. It's all about doing everything you can to keep it going out of waste. If you can't repair it - repair is the first option and there they look to sell it - if they can't repair it, they'll scavenge it for parts. Then once it's been scavenged for parts, whatever's left then obviously in places like Sweden and Finland, they've actually got robust and appropriate recycling methods available to them.

Although not necessarily always in country. I was actually quite surprised, I'm trying to remember what the waste was. I remember speaking to their environmental engineer in Helsinki and they admitted that there are some wastes that they cannot recycle in Helsinki and they're actually shipping them over to somewhere in Germany to be recycled. So even a highly developed country like that, which I would say a lot of their practices are at the fore, they still don't have all those capabilities.

I guess just to echo what Mary said and I think I heard Hugo say when he was in LA, I did attempt to shoot this project, to mind this photography project when I was in New York and Brooklyn and it was an utter disaster. There were so few examples. I went, screw this. I went and photographed something else instead. It just got to the point where it just wasn't going to happen.

I'm sure it does in other places but I couldn't spend months touring America finding the places where it did.

I tend to look at this and go it's interesting that even in very diverse countries I see these similar patterns and that interests

me. The ones that seem to be doing well, I'm not saying they're perfect, but the ones that seem to be doing well around repair and reuse, this pattern of what they try to do with it and the scavenging and hoarding the spares so they can reuse them, whether it's almost on an industrial scale in Helsinki or it's literally in a shed, which is what you'll find at the side of the road in Havana, they're the same.

The other thing that I think I mentioned before is no matter how much people think we can help solve the problem by providing the online manuals and everything else which are a key component, Havana, it's an oral culture that used to actually train people to repair.

It was exactly the same when I was in Accra in Ghana and when I went to Kierrätyskeskus in Helsinki, again, it's more of a hands on oral culture. As I think I mentioned, even my little shop around the corner that repairs which I've been into today, they keep a whole bunch of kit that's broken, but they use it to get their new employees trained in how to take a phone apart properly, how to understand the fact there are different size screws. And it's really, really important you are very careful that you know exactly what screw came out of where because if you put the wrong screw back inside, even though the screws look identical, you put the wrong one back and you crack the motherboard, the whole device is dead.

So you can read that but actually doing it is critical. There are some things in there for me that are just fundamental wherever I've seen this done. For me, whatever ultimately reuse city is, I just see some of these components will be essential. Now how they're done and what novel ways to do them is another matter. I think they're pretty fundamental to all of the places that I've seen actually have reasonably good levels of repair taking place.

Female: An example- sorry.

Male: Go ahead Mary.

Female: I was just saying, remember the Haiti disaster, I was here in
                     the States and we were just filling shiploads of clothing and
                     what have you to the people in Haiti and they ended up with
                     just landfills upon landfills. As you said, Mark, at the end a lot
                     of these countries don't have a way to get rid of something
                     when it really, really comes to the end of its life. That's a huge
                     problem.

                     Sometimes I often think I have to hand it to the EU, they have
                     in some way decentralised by centralised some sort of
                     authority around how countries [___ 00:43:48], that's huge.
                     Whereas when you're in the States here it's so big. When
                     you're in a less developed country there is no way to
                     monetarise.

                     I often think if there was a global board where you actually
                     could systemically organise each country and even states
                     within the country depending on how developed they are into
                     where they are in these cycles or what cycles they can
                     manage, what they can manage within the cycle of items. It
                     would then make it much more clear where the opportunity
                     was for people or companies or whatever, entrepreneurs to go
                     in and say, "Okay, you need it here, do this."

                     Everywhere, as Mark, you pointed out, is so different. I also
                     see a lot of the companies that do well in the resale business
                     are companies who have attached themselves to a fairly
                     successful corporate company and that becomes- there's an

offshoot, whether they either- the successful company takes it over or whatever and a lot of the reason for that, particularly in the high end recyclables is the authentification of something. So it still has the stamp of approval.

I mean a great example of that I suppose is something like Audi or BMW, whereas you buy a new car off the lot but then they promote their second-hand cars and people will buy it. It's got the brand name but also because it's vouched for.

Anyway, it's just some of the things I see but I actually also see given this, things will shift back to the way they were in the consumer society we live in. I also see a shift in an acceptance. People are beginning to accept that it's okay to take something from a neighbour. It's not whatever, dirty. It's not whatever, it's useable. So there is a shift happening now. I think, again, like the pandemic, it was a virus that it didn't matter if you're rich or poor, you could get it.

I think the mind is shifting on what's acceptable, what isn't. I wouldn't say there are thoughts going to an agrarian society but people are beginning to see the goodness in that and that's been very extreme, if you see what I'm saying.

Facilitator:	Hugo, you raised your hand a minute ago.
Male:	I don't want it to be a non [___ 00:47:06], it's something that had come up before but this idea of employment or the possibility for employment through repair. I've just been really thinking that this is something that needs to be subsidised or at least that the entrepreneurship in those spaces has to be supported.

Recently I looked up something that was wrong with my printer. Found a YouTube tutorial, it was probably the deepest part they could find to have me fix and so I tried to take it somewhere. I get around and they said, "No, it's cheaper to buy a new one," which is not- I knew it happens a lot but to me a lot of these things- getting people comfortable with that idea again, there needs to be almost making it possible to repair anything affordably, so that it can become a default.

Until you keep it to a handful of different clothes, the spare tyre on your bike, you're not going to be able to have a mature circular and emergent. Something where there's different spaces inform themselves.

Smart phones are still doing okay and that's a great place to study them but then how that leads into other electronics. I'm really curious to see how that happens and how we can prepare that discussion around repair to circularity and to bigger programmes like Doughnut Economics and all those to get people interested and get policymakers basically interested.

From that perspective I think the work Precious Plastic has been doing, even if it's super isolated, but seeing how they start with their machines then improving the modularity and the buildability of their machines and now focusing on the business models that their machines have made possible.

 Still there's a lot of work to be done, I think it's really interesting to see just looking at the livelihoods and makes possible, the kind of investment that represents. I think a really interesting place to look could be also the [___ 00:49:25] between gaming centres, building gaming computers, repairing them, upgrading them. One, because there are a few types of demand and income and two, because it's a market with a lot of investment and dynamics.

So those were a few thoughts on the topic.

Female: You hit something there because you mentioned the gaming industry and hardware associated with that. A lot of, and I don't wish to stereotype, but a lot of the people in the gaming industry are technical and so within the community of that it's an easier repair. There's less steps to that and they understand the tutorial or maybe they don't even need- so that's a really good example of where something is produced for a community and within that community it can be repaired as well much easier.

I go into places, like, whatever, the Goodwill, The Salvation Army, whatever places salvage. My husband laughs at me, "She's going to another salvage place." But I find it interesting that the electronics are always in a huge pile because either one, nobody recognises the brand, number two, how do I put this wiring back into the- again, and do I want to spend time when I can go down to Ikea and buy something, whatever.

Facilitator: I think one of the things that I started, because originally this year I would be focusing on more concrete, technical prototypes and I would leave because of the structure of the research project, I mean I would leave anything related to policy for later. I think it's hard to avoid these kind of places.

Male: Absolutely. I agree Felipe. I said my own research, although it was different, it was looking at innovation ecosystems. I see this as really no different. We try and create innovations in the way that we repair. What was very, very clear from that research was that if you want to build a sustainable and viable

ecosystem, you've got to address it in a multifaceted way. You do need policy change. You need something that says the rules are going to be, that anything new that comes into this ecosystem, I'm talking about goods that are made, need to be made with a right to repair becoming more prevalent. So that has an impact on the way things are designed and it has an impact on what manufacturers do now around the release of information and knowledge and spares in order to do repair.

In Sweden, they look to encourage people to consider repair by doing things like reducing the VAT on repairs. So they have the VAT on repairs. So that's a policy level decision where you can create some fiscal stimuli in order to encourage a behaviour. So there are things like that that can be done.

So you got stuff around policy. You got stuff that then obviously impact the OEMs and the manufacturers. If you do something in education, you've got to do something around enabling a community of repairers to thrive. I mean I think repair can be a solo act, if you can access the information, it can be- like my little repair shop around the corner, my friends there, Ronnie and Kara, it's mother and daughter that started this business. There's now 6 of them working in there.

We're a small town. There are only 20,000 people in this town. It's 1 of 3 repair shops we got in town and it's quite an affluent town. If somebody said to me do I expect people to repair stuff here? No, because nearly all my neighbours drive very expensive cars and have more bling than you can possibly know what to do with because we're just outside London but there's 3 repair places that focus- these are my friends. I get on with them really, really well. They need to thrive. An individual person needs to be able to repair if they want to but then I think there needs to be solutions that sit at a municipal level. And I don't think they'd work necessarily in a small town

like the one I'm in but they need to work in places like the Londons, the Helsinkis, the LAs, the wherever.

So those solutions, people, like, in [ReTuna 00:54:33] in Eskilstuna in Sweden. I know there's some initiatives in Germany at the moment, in Berlin and then the Kierrätyskeskus in Helsinki. They're at a different level because these are things where people have maybe said, "You know what, I can't afford to justify the commercial repair anymore but I really don't think it should go to landfill or go to the recycling centre. Maybe somebody can do something with it."

Then through these Kierrätyskeskus, these reuse centres, they find a way of putting them back to use. They'll repair them if they can. If they can't repair them, they scavenge them for parts. Then they'll repurpose things. I've got photographs of old skis and rackets and you name it and clothing. They told me there's certain brands of clothing they can't do this with because the material is just shit, it's so useless but they will do things like they will take clothes apart and they'll make craft kits out of them for people.

They are literally trying to do everything they can to avoid it. Then on top of that the thing they've realised they need to do as well which I mentioned before is they've realised that they're only going to nudge the dial even more if they educate the population to be much more thoughtful and think a lot more about the options that they got.

So when you start to look at it. There is a policy bit, and there's maybe some fiscal stimuli and then there's things we need to do to encourage entrepreneurs and set up their own businesses but there's things we need to do at municipal level. There's things manufacturers need to do.

So it's quite complex and, for me, you can't solve the whole thing but there are some fundamental things that you do need to have in place I think for a viable ecosystem to work. I think the policy bit, as much as it's a nightmare, because it just seems to take forever to get politicians to do anything other than be corrupt in the UK. Apparently our politicians are really corrupt. We're trying to outdo now the Uzbekistanis and the Bulgarians of this world in the UK. We're unbelievable but let's not go there. That's the only time they ever seem to move.

You have to do that, so energy has to be put in it to make that dial shift. I know USPIRG and the team there and in Europe you've got the Right to Repair Movement are all trying to nudge that dial. That has to keep happening. Then there are a lot of things I think we need to think about how they can be put in place. I think municipal lead reuse centres, where something's no longer commercially viable, maybe a small commercial repairer, it will be too expensive for somebody. It gives people an option other than just sending it to the recycle centre is not that difficult a step.

Where I've seen this in Scandinavia, it has a spin-off effect as I think I mentioned before, Felipe, which is that not only do they maybe save 75% of stuff from going into the "recycle of waste system" they find other uses for it. They either repair it, reuse it, repurpose it, etc.

The other thin git does is it provides local mechanisms, social mechanisms to, one, to educate people but also to re-engage people back into society. I had a lot of difficulty taking photographs in these places. I had to be very, very careful what I did because a lot of the people who they would have working in these, I mean admittedly low level jobs were- and trainees would be people how maybe had been migrants or

they had come out of the prison system or they had come out of either drugs or alcohol or some other problem.

This was a way of them getting back into society, having a meaningful job, getting some stability in their life. There are all these other social aspects and actually getting to do something that's practical, useful, they feel valued and they come out of it with a skill. So that's all these spin off effects that can also be created which is hard to put a value on but they're huge in terms of a society.

I look at it and go, "Okay, you have to look at the whole thing. You're not going to solve it all yourself but be aware of all of the bits that could connect." Then it's a case of where can I nudge a couple of levers and then hopefully encourage a few to move the whole thing forward.

Seeing things like that have been quite- I found them quite inspiring. Part of what I'm trying to do with my own project is to just get that out there somehow, some way. I don't know, how could I translate what they do in Helsinki to London? I don't know, because they've been doing it in Helsinki for 30 years. They opened these centres in the '80s, actually it's nearly 40 years now. Something needs to happen and it'll only happen if the city council decide to do something which is all getting back to a policy level, although it's a local policy level.

I agree, Felipe, it's maybe not what you want- you maybe want to look at what are the solutions and then I think the next bit is what does policy mean to enable those solutions. The solutions won't happen I don't think if the policy isn't there. They'll stop it.

Female: The other way of forcing the policy and sometimes that takes movement around something. Movement in the sense, I'm not

talking about mobility, I'm talking about creating a movement and thought around something. Making something sexy and that sometimes gains momentum and it does force policy around okay, there is ground roots people surrounding this, maybe we should do something. Maybe it'll get me votes if I come behind these.

I see that in the last few years here in San Francisco, it's a very- the division between the rich and poor has become- in the last 10 years really it has become really, really wide.

So as a result you have the well-educated, in-between who they could fall either way, depending on their support system.

So you have people like that seeing maybe there is a better way to do things. I also think, and I think you mentioned it in one of your needs, Felipe, is in searching people, at least what I think trying to figure out when you're assessing objects, where do they lie? Are they repairable, are they not? How do I put a monetary value on this? I think there's not enough people educated out there on this.

Sometimes it's somebody that has industry knowledge but I think a lot of the courses in university or in technical schools I think they're lacking, for want of a better word the trade component of the recycle world. I mean they're great and the visionary idea of something has to be done. We should do this, we should change the system but in the ground roots level you have to have this practical knowledge of how these things can be done.

I don't want to take too much time on that. I get on a hobby horse here.

Male: If I may jump in, because I completely agree with you, Mary, and one thing that's come to mind also is just I've been really surprised how few links there are between the maker movement and repair.

Female: Exactly.

Male: You have some overlap, that might be personal with repair cafes and you have similar faces but I've always been surprised that there isn't more of an overlap or official overlap or explicit interest from the maker side. I've seen a few people that I've met in maker spaces or fab labs that have gone on to make their own studios or companies to focus on it. At the grassroots level, like you were saying, it's often separate and it's much more emancipatory or DIY entertainment with electronics things. It's more that aspect which I thought was really interesting and surprising and something I found myself, to your point, the trade, the skill of repair I'm lacking and I'm hoping to work on that in the future.

It's something that I saw and then a couple of other things I wanted to echo from your side, the point of the brand and the importance of the movement to motivate politicians. I'm researching a little the Doughnut Economics model and its use in Amsterdam. Some of the people we spoke to who were architects and creatives who are involved with the city of Amsterdam prior to the big Doughnut Economics reveal, I don't know if you're familiar with it, but basically it's this project that Kate Raworth has put together, a big framework.

At first it was a way of looking at society at large and seeing how much it's overconsuming. I know she's adapted a model for cities and municipalities to do what she calls the city

portrait. So Amsterdam has jumped on that ship. Apparently a lot of the players right now are saying, "Yes, that was part of actually Amsterdam's existing circular city agenda and it has now been rebranded but now there's much more renewed international interest thanks to the rebrand and thanks to the new message," which I thought was really interesting and why I think repair should definitely be tied to this circular logic. I mean it is by definition but also in the language and the branding it has a lot to gain.

Facilitator: Sorry to disturb. I'll just take the door but I'll be right back.

Male: Just while he's gone there, I completely agree. Actually the thing that worries me a little bit that I've seen some of the models, the representations of circular economy, they underplay the repair component. [___ 01:06:05] show this make, use and then they have this recycle bit and you go like, excuse the French, "Fuck, no, you missed the point." So actually there's a potential dilemma in the way that people are portraying the circular economy.

Sorry, I was just echoing what Hugo has just said there, whilst people talk about the circular economy, a lot of the visuals that people use and a lot of the imagery and the way they show it has the potential to undermine the repair component because you see these damn models, as I say, with a make, then there's the use it, and then more often than not, the repair bit is a little tiny loop here and the big part of the doughnut or the circle is the recycle bit. It's like now you missed the point. The diagram should go round here and show this repair and reuse big, and the only a small bit comes out as recycle.

That's the model they got at Kierrätyskeskus. We discussed the numbers there, 75% of everything that physically goes into those 8 facilities in Helsinki is repaired or repurposed. Only 25% gets recycled and of that virtually all of it gets recycled properly as they would describe it. In other words it doesn't end up in an incinerator which doesn't count in my book.

Unfortunately where I live they think it's a really good idea but we're not going to go there.

Female: Mark, do they deal in that centre, what type of goods do they?

Male: Name one and I'll give you a yes, no answer.

Female: Is it clothing, is it furniture, is it bicycles, is it electronics?

Male: Yes, yes, yes, yes.

Female: Okay.

Male: Driers, they'll take old sports equipment and either refurbish or repurpose it. There are thousands of bicycles. Take a look on the link that I put in the chat and you'll get a sense of the scale. I don't know whether I got all of the images- I got a few images from Kierrätyskeskus there. There's everything, there's old electronics. I even saw a Commodore 64 computer being repaired complete with original games.

What they'll do with something like that is- so they have a store that they'll sell it all in but actually they're smart. What they said was, they know something like that has got much higher retail value because it's a collectable than just putting it in the shop. So they'll sell that on eBay or they'll sell that online because they know they can make more money for it.

By the way the way these facilities- so they were funded by the city, the way they work it. They self-run, so they have their own management board. They act essentially as a not for profit. They employ people, like, I mentioned all that diversity. They got everything from qualified environmental engineers to communications people. As I said, people that just come in and are trying to rebuild their lives. They have the complete spectrum of people there. All the money they make either is basically the city say, "Any money you make has to be ploughed into improving the environmental performance of the city." That's it.

So if they make a load of money, I said at the moment what they're doing is just spending a lot of their money on education because they realise if they want to shift the dial anymore, they've really got to educate much more of the public around the importance. And they'll shift the dial they know doing that because it'll mean that more people are likely to drop stuff off etc.

I mean they don't do cars but they do pretty much anything else that you can think of.

Female: I mean they're making the whole business viable as well? I know you said it's not for profit but it's commercially viable. They do the whole cycle, the fact that you can actually go in there and buy the end product.

Male: And it's got a warranty on it.

Female: That's huge and you picture this, if the world was all sitting at a dinner party, the person that says, "Oh I got mine and it came from here and it was repurposed," you're definitely going to be the most upstanding citizen.

Male: I mean they don't have it everywhere and Finland's got some other issues but this is one thing, at a city level, they're doing I think a little bit better than anywhere else I've seen so far. I mean the only place- well, I don't know other places that are- I would say Havana does it equally as well but they do it for very different reasons.

Female: It's very impressive that they do everything.

Male: Sixty years of embargo have sorted that one out. There are so many parallels, two completely different places on the planet. I see a lot of parallels there.

                I'm trying to think about we need to find these, what I would call, islands of solutions and things we can tangibly do and then work out how do we join them up? Ultimately it's got to work as an ecosystem.

Female: That's right.

Male: One point on this also I think you can't do it in isolation, you can't keep the industry vertical. You can't just have bike repair or this or that. And to your point, you need to be able to have some overlap across the things you're repairing to have that flexibility it seems.

Male: To a degree, I think, yes. I think so. I think if you only focus on repairing one thing- I don't know, I suppose my little local repair shop can do that but I think if you're going to do something at a municipal level you need to have a broader capability. Otherwise what you do is you create a problem for your citizens. As soon as your citizens got to go, "Now, where do I take this?" You've immediately created a barrier to them. If they suddenly got to go, "I've got to go A for here and B for here," they won't do it.

If you just go, "Drop it off at your Kierrätyskeskus, by the way, if you can't drop it off, because it's a white good and it's too big, ring us up and we'll pick it up," which is the other service they offer. Then they have a one stop shop and it's simple.

Absolutely, Hugo, you have to make it easy for the public otherwise they definitely won't do it. I mean the UK has had problems for years just getting people to work out what bucket to put bits into to recycle.

That's a really important point. I think you have to give people simple one stop shops. As soon as you start making it difficult for people and they have to start making decisions and doing some work, you've created a barrier to it happening.

Facilitator: I think there's a lot of inspiration in this discussion. I don't want to interrupt because I'll have time to go into it later and reflect.

Male: You've got months to think about this, yes.

Facilitator: I think one question, Mark, I guess the situation of chicken and egg, where do we start? I think telling this story is useful because even though you have these two extremes in Helsinki and in Havana, the experience I had in Brazil was when trying to talk about this possibility of creating a place in which people would just collect stuff that is being discarded by others, the local authorities - even though they saw this skill in the communities, in the poorer communities - the local authorities always thought that that's not desirable. That's not our path for development. We should not be repairing stuff.

We should be trying to bring- this is the development model you have in smaller places in Brazil. We have to attract some industry plants to be installed in this city. And for this reason we have to make the environmental regulations more flexible so as to attract. And then we can some subsidised and then they will bring their industrial production here and this is the way to develop.

My discussion with them was that we should try to create things from materials that are already in the city, that are already being discarded here. They say, "No, that's not the way to develop something that is inclusive or thriving in economic sense." Using that story, bringing that story from Helsinki, it can be useful in that place in Brazil, just by saying in this place, in the developed world these things happen and they have this kind of socioeconomic inclusion based on that and it's creating local jobs.

This is the story that must be told, even though it's way more complex than that and there maybe problems because there

always are loose ends. I guess telling these stories one way to go about that. I agree that creating this one stop shop in which people just donate stuff is fundamental.

The other thing I guess to what Mary brought before these things are sustainable. I don't think this effort should aim at being economical sustainable in the sense of being- how the operation being paid for by whatever money they make in selling stuff because we would be always competing with the industrial development. I don't know if it makes sense outside of Latin America but we usually call it industrial populism. Populism being understood as in politics in Latin America as going beyond your current means and not thinking about the consequences in the future to provide quick and superficial satisfaction to the population.

So the way that industrial production happens most of the time is that it's populous in that sense, that there are consequences that the next generation will need to be concerned with. Right now you're just delivering cheap products and cheap consumerism to people.

I don't think these kinds of efforts should or could even all of the time be sustainable by their own means. I guess this is an amazing alternative for profit corporations taking care of recyclables or taking care of waste collection in cities because usually their main goal is just to extract profit with as little investment as possible. I guess we should create this socioeconomic inclusion means.

We've reached over an hour, I just want to create this image and to hear about how you feel about it. Just one other element, one of the elements to change this ecosystem and as usual you change an ecosystem not by changing the whole of it but creating inspirational notes. One of them is telling a story and the other, I guess it's projecting for the future. So telling

the stories from the future and I think Hugo could tell a bit more about it but maybe he'll leave it for his presentation next week.

The other thing I want to explore and hear feedback on is this, what is supposed to be my- what I'm prototyping in the next couple of months, that is this scenario in which there is this universal database of objects that stores and offers information about what is an object? For instance, this very fancy mouse, what is this made of? How to repair it? What is the end of life policy of the manufacturer? Who is the manufacturer? And where you can take it to be serviced? Whether there are spare parts available?

This kind of information to be available for different users. On top of that thinking also of ways to interface that with people who are interested in repairing or reusing stuff. I'm thinking of a mobile phone app and I'm thinking of a work bench machine in which you just present it to the camera and the camera will recognise this object and would give you information. Okay, this can be serviced, this has this and that, end of life policy.

I'm thinking of these two layers for this because I assume I'm not that excited with this part of my research but I'm supposed to do some kind of concrete prototype and I thought that this maybe something useful for this discussion. With that I wanted to ignite the discussion about the social and economic ecosystem that would surround these kinds of practices. I need to give some kind of shape to that. I'm thinking about this layer that is a data layer and the other is, for instance, a machine that would help me access information on that data layer.

Male: I got you. I understand. Just a couple of things on there. These are just thoughts, increasingly now and clearly it's been driven by consumerism and supply chain and particularly big retail,

almost all new goods these days come with a huge amount of information embedded in them but we just don't realise it.

So I have a box of broken gear down here but this thing has got a barcode on it, this barcode gives me its serial number, its model number, you name it etc. This stuff exists all over the place now on almost any product you choose.

Behind that somewhere, someone, somewhere has got all the information. In theory you could probably get most of the supply chain information. In other words what materials, where they came from, you should be able to get things like the repair manual etc. The big desire that manufacturers have had around manufacturing efficiency and supply chain and then retailers have had around product identification with GTIN codes, as they're called, and they're standard is called GS1, mean that actually for a lot of objects other than very small ones, just scanning the barcode on the kit, if you could get all of the embedded information, if there are ways ultimately of making that available, the means of doing what you want, Felipe, are not that far away.

In fact in some industries, and this is for specific reasons, but in the pharmaceutical industry they've taken this to extremes because there was such a huge fear around counterfeit objects, counterfeit drugs being sold that they had this programme in many, many countries called Serialisation. So what they do is they have all this information embedded in the 2D barcode but also embedded in there is like a secret code that a regulator could go and check and they could therefore check whether this was a counterfeit product or not or one that had been illegally imported or whatever.

Industry behind the scenes has been doing lots of things that could enable this even though the intent to what they did was for something completely different. So [___ 01:23:42] explore.

Female:	I apologise, Hugo, sorry, from being in an Irish school; where you had to put your hand, I stopped doing that when I became- I'm sorry. I just wanted to reiterate what Mark said, Felipe, so we started looking at, and it was down the line what we were going to do was- initially we looked at Blockchain, which is the sexy word right now, but it was a way from the time the material is produced having a code on that and at least get it along the start and the supply chain from the very beginning through to when the time was sold and resold, whatever as a way to focus on the object as opposed to the people around it, the buyers, the sellers, the manufacturers.

A lot of that, as he said, already exists there. The question is trying to pull it altogether but it is definitely- you could even start by just creating your own barcode from where you buy it first, leaving out the initial supply chain, the manufacturing. Their tends to be a lot of monopolisation on that and so start there. Eventually force the previous cycle to get in on that.

There is a thing in the industry right now and Apple is like that. It supports but it really doesn't support the secondary market around its products because it wants to sell more. The people in the clothing industry, the people who do make an effort, it tends to be more for the media. H&M being one, it's producing as, Mark, you said, really, really bad clothing that you can't do anything with. It has to be seen, as a big producer, it has to be seen to be, so it has a small little section that it will do recycling stuff so it makes it look good or whatever.

Getting back to my original point and what Mark had said, there is a way to do this and it probably is an easier way to do this than to force policy on every city in the world and that is by just looking at the actual object itself and having that- which

adds authenticity to the object as well. Sorry, my hand is down now.

Male: So you just got me thinking there, Mary, so what we actually want to do here is if we can either use the barcodes and the product codes or if we haven't got those available, as you suggested, we look at the object and maybe there's some image recognition type software that allows us to do that. What you can do, we talked about how do we circumvent the system if the system doesn't want to do it.

Female: You have to circumvent.

Male: We want a Wikipedia of things for a better way [___ 01:27:10], that's what is needed, is a Wikipedia of things and you just get a community of people who have all got a common interest adding to it. There are risks associated within that. People will add to it without necessarily the knowledge and therefore there'll be errors but in the same way that Wikipedia, whilst it's built sufficient momentum, there are people in there who fix it, so errors don't say for very long.

Maybe that's the approach here. People like 'I Fix It' have already done a great job in getting 15,000, 20,000 repair manuals out there in essence. They got stuff already. It's about how you add to that knowledge base. And that does on thing, I think it gives you that technical layer but as I said my experience is that's a partial solution. We need to add these other bits in.

Even if you've been on the 'I Fix It' website and you followed their video very carefully or they tell you how to take it apart,

there's still no substitute for the physical practical doing it. You're probably going to break the thing the first time you do it. You've got to accept maybe it doesn't survive but if you got to the point where actually it's going to get "thrown away" if you don't, you can accept there's an upside to it and there's not really much downside.

Female:

I think you have to move away from- there is the hobbiest movement, who have in their time look at the videos and will try and fix stuff. You almost have to expand that to- everyone said earlier that people who are doing this for a living, they depend on it.

Even going back to Blockchain, to your point, Mark, is if the community involved guards what you put in you're responsible for. So in that ledger, if you like, and I'm not saying we do Blockchain, but I guess in that ledger of things what goes in, the inventory of things, it's tied back to whoever put it in. It sort of builds in a set of responsibilities there.

Male:

I would look at this- sorry, Felipe, my view would be, I could see a Wiki type solution adding to all the things that you've just identified. I could see setting up something that's modelled on Kierrätyskeskus elsewhere. They're adding to the jigsaw puzzle.

I think it will be naïve to believe we're going to get large numbers of the population repairing things themselves. There will always be hobbiests who are prepared to do it. But even in a country like Cuba, I mean Havana where people will still tinker with stuff because they've had to do it for years and years. If they've got a piece of electrical gear that needs fixing

they take it to the local electrical repairer. If they're in South Havana, they go and take it to Ivan.

I literally know that if they don't take it Ivan they take it to Ivan, which is his son. They run two shops in South Havana, it's Ivan shop or Ivan's shop, it's one or the other. That's the only place you go with this stuff because they've been there for years and they know what they're doing. They offer a 3 month warranty on any repair.

You get a combination of expert repairers who may have specialisms, you may have some municipal stuff or the stuff that the experts, it's not economically viable for them to repair it. You have Wiki solution information, knowledge based solution that means you can do all those things that you say. You can go on your phone, you can scan the device or you can look at it and it'll tell you and it may even give you a repairability or view of repairability. I could almost envisage seeing at the end of the day I've got my device, "Can you identify at very top level what's wrong with it?" You go, "I think it's either this or this," and it'll give you a view as to how repairable it is.

There's some work being done in that area by the Restart project by the way. It just reminded me. I've been contributing to it. The Restart project have been trying to create a knowledge base of all the objects that have ever come into repair cafes and restart projects and they've looked at the top level descriptions of symptoms and they've tried to identify what's the root cause of the problem. What fundamentally caused this thing to break? So that you start to build a knowledge base around the most likely thing to happen to a mobile phone is it's either been dropped and it's got a broken screen or it's got wet. I mean they're the two most common faults on a mobile phone. It's either been dropped or

somebody's got it wet. Then obviously if it's got wet, it's a very different problem to replacing the screen.

I could see all of that eventually going into a knowledge base that means you got a, not guarantee, but you've got a top level view that's going to give you a sense of how repairable is it or not. You might look at it and go probably isn't very repairable but I can go and check my local shop. Local shop says, "It's going to cost you £100 to repair," or whatever and you go, "No, it's not worth it."

You know the next thing you can do with it is just drop it off at your equivalent of your Kierrätyskeskus and say, "Look, it's not worth me repairing it, it's gone but somebody might be able to make use of it."

Actually even my local repair shop would take it and scavenge it for spare parts because I just had a house full of them. You can't see it very well. I borrowed all their broken kit, everything they had that was broken and I've been photographing it.

Male: Nice.

Male: I'm doing weird stuff here. I've been trying to photograph it in lots of different ways. What I'm trying to represent here is this is infographics, this is electronics and the light bit represents how much of the electronics is actually recycled properly.

Female: That stuff is very powerful, Mark.

Male: I've literally given them all their junk back today. I had literally- my wife was going spare. I had boxes of bits of phones, iPads, you name it. I was trying to find different ways to photograph and to create something that looked like an infographic but wasn't a hand-drawn infographic or a computer generated. It was the actual stuff. I'm working on it. It's not finished yet.

I guess back to our- I could see how this thing that you're thinking about, Felipe, could be a part of that, that almost helps you navigate where you need to go in the ecosystem to get it sorted. That would be really useful. It's almost like think of it as a navigator rather than the absolute solution. It's going to help point you in the direction t hat's most sensible.

Hugo, sorry, here you are, I'll shut up.

Male: I completely agree with you and that's one thing I wanted to come back to, to your point, Mary, about Blockchain. I think there's some really interesting stuff happening in the game design world actually and perhaps more philosophically than practically but with Blockchain NFTs. I just spoke to someone from ReSoft who is looking at having assets, like, a sword or a car in one game, be assigned a value and become another item in another game and therefore gain value over time especially in competitive circles.

So there is some really interesting things here, especially on the side of value, not just the traceability of something and its authenticity but the value as something that has seen time and has gained a patina, like a poetic patina or a narrative patina, which I think is really valuable and we don't speak enough about this narrative, poetic, creative angle to repair and to making and how it shouldn't be just isolated.

The last bit I wanted to say about this idea of traceability is the issue traceability which I'm sure it is in some part but I feel like also readability, literacy in this repair and being able to make sense of a situation. I felt like if there were to be a digital infrastructure that is supposed to help that, I felt like use cases like forensic architecture. I don't know if you're familiar with it but I think [___ 01:36:27], something like that, the architect who runs it.

I've shared all of these things in the Miro but basically they do a lot of investigating over exploitation of a forest or a crime that has been committed by triangulating different data points, like, a WhatsApp audio message plus footage from a news report plus something else in a way that is almost artisanal compared to what other places have done.

They become really good at this sleuthing through digital cues or clues. To me, that's also another aspect that we're not going to have this surveillance materialism or just tracing every single step and having checkpoints and barcodes, but also being able to- like we talked about education at the beginning, this ability to read or unpack some story a little bit like Sherlock Holmes to leave behind a thing and make that part of the idea. So that's all I wanted to share on the points you guys have made.

It's been a really wonderful talk. I'm so glad that I've been able to join.

Female: Felipe, is there anything, I know you had a whole list of things you wanted to go through, is there anything- so if you get off this call and you say, okay, was there anything not answered for your, well, there's probably a lot but I guess is there something that we should touch on that would help bring you to your next level of in terms of what you're going to do next?

Facilitator: Actually, no, I'm really satisfied and I would like to address a lot of the points in the discussion but I think it would be useless because there's so much fruit for thought here that I'm really glad to have had this discussion.

I was just thinking that I think we have material and interest even to think about later on about a seminar or something because there is so much to discuss about these issues. I'm really amazed, I'm really happy with this discussion and I think there will be a lot follow up and I hope I can do that in the next couple of months.

Next week will be-

Male: You have to be [___ 01:39:09].

Facilitator: I need to. Next week what I'll try to do is to make these ideas about these prototypes I'm trying to do a little more clear and then to get specific feedback on them. Even here, I guess there's a lot to discuss already and I was happy to say, for instance, to think of this database or ledger as akin to Wikipedia. I have my own criticism of Wikipedia as being praising the individual editor as a very atomised node. I would like to think of that in a similar fashion but to think about not using Wikipedia as a model but Linux and that connects with- you can have this amateur and the hobbiest contributor to the Linux scale but at some point you can also connect that for instance with an institution or a government that is paying developers to be part of that.

In that sense I guess you don't need to necessarily distance the discussion from the hobbiests but you can incorporate the

hobbiests but also organisations paid for by zero waste
initiatives.

Male: Yes, maybe [___ 01:40:41].

Facilitator: Universities and right to repair legislation. I guess you can build
                         these kind. This again comes to the point that we discussed, I
                         guess, in the previous meetings about thinking not necessarily
                         of a database but instead a kind of protocol or a standard for
                         these kinds of fluxes of information, flows of information.

                         There was just one other thing that I'm reminded of the
                         discussion I had a couple of days ago with another participant
                         who is also in the US, he's in Colorado. I lost it. Just lots of
                         inspiration but I'll get back to it eventually.

Female: I just wanted to say I really enjoyed the conversation here. I felt
                         we could have gone all day.

Facilitator: We'll have the opportunity next week and I hope Hugo will also
                         have a chance to present his work.

Male: I'm hoping to make, if ever possible, a career thing out of this
                         topic. So if you ever hear of leads or have any advice then I'm
                         all ears. If there was a way to work in the [___ 01:42:04]
                         academia. I only have an undergrad degree, so it's a little
                         tough to make plans for a PhD just yet.

Facilitator: In some cases you can, I guess, there are opportunities but this kind of perspective of reuse, I think it's not that common even in academia. There's a lot of literature about recycling and improving the efficiency of recycling or there's this very interesting course that is available on Coursera about waste management in developing countries. They mention informal repair or informal recycling that includes reuse and repair but they don't follow that trail. They go much more into collecting and recycling basically organic materials.

Male: This reminds me, have you seen the work of Charles Jenks on Adhocism?

Facilitator: No.

Male: To me it's really hit that- I'll share the link here but Adhocism, the case for improvisation and it's a really nice book on different types of DIY, hobby, repair, reuse but really much more from the creative perspective than a waste reduction perspective.

Facilitator: That can be part of I guess-

Male: I just remembered it so I thought I'd ask.

Facilitator: Nice, thanks. I think we could go for hours but I think it's enough for a lot of future discussions. I'd like to thank you for your presence today and hope that we can find also

opportunities to discuss in the coming next two weeks as we go further with the lab. If you have anything else we can also keep discussing over email or the Telegram group or other means. Maybe a quick round of bye if you want and that's it.