Duration: 0:33:19

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START AUDIO

Interviewer: You are generating data about these waste streams. I hope I can try to understand, with your work, whatever points I can add to my research. So, I would ask you first to tell me a bit about, in general, how do you describe this work that you have been doing and where it happens and what kind of institutional-

Respondent: Sorry, can you repeat that because you just broke up for a minute.

Interviewer: Sorry. If you can just start with an overview of your work, in generating data about waste streams, I guess we can maybe jump from there.

Respondent: Okay. I am a private individual. I am not associated with government. I was just interested in environmental aspects and topics in general. I just went to look for data online because these days, you have got quite a lot of open data. What I found was this dataset which was provided by government. It is called, 'Waste data flows.'

So then, it was one of the datasets that I downloaded that was probably most interesting or most granular, around environmental topics.

Interviewer: Your connection is breaking.

Respondent: Okay, sorry. I was just saying that another reason why I chose this data was because I didn't see many other people using it and I thought it was because it was a complicated dataset. So, there is a barrier to entry and I thought that if I just do some work around it and publish what I have done, other people will be able to see how to use that data. So, that was the initial idea. I was also involved with other areas, like zero waste idea and the Restart Project.

So, they also have some datasets I was working with particularly. It is quite an interesting dataset. It is a graph, if that makes sense. It flows to and from. So, it all about flows of tonnes from local authorities through to different processing facilities and how all of it gets separated or combined in the process. So yes, it is quite interesting. It will be quite… another-

Interviewer: It's breaking again.

Respondent: Okay. So, another interesting outcome, I thought, from this work, would be for policy makers, for strategy. So, for example, they would be able to compare some of the flows, so how much of each material, but also, by different local authorities, by different regions, how something like lockdown might impact the recycling process. With that, they will know if, in particular, inner city barriers, for example.

There is more of an impact, perhaps, maybe than some kind of educational campaign needs to be targeted towards that. They will be able to prioritise, a little bit more, resources better, I think. So, the other things you can look at are when there was a time when China stopped accepting recycling materials from Europe and the UK.

So, I wanted to see, was there a step change, maybe towards local recycling, processing of those materials, or did that result in higher incineration volumes. So yes, all of these questions can be answered with this dataset.

Interviewer: Right. What is your background?

Respondent: I am a data scientist, so I normally do this for a living.

Interviewer: It is breaking again.

Respondent: I work in [audio breaking] more corporate. Yes.

Interviewer: These datasets, you said it is provided by the government. What institution provides that? Or, are there different sources?

Respondent: Well, it is a questionnaire that has been asked of all the local authorities. This data is released on the… I'll send you the link of London Datastore. It is managed by that waste dataflow team. So, they are not a particular branch of government. They just raise dataflow. So, I'm not sure who actually manages

them. You can ask them. I can give you their emails or whatever.

Interviewer: That's great.

Respondent: What was the question again? Oh, that is it, isn't it? I have answered it, I suppose.

Interviewer: Yes. Is this a one off or is it updated regularly?

Respondent: It is what, sorry? What is the question?

Interviewer: The dataset that you are working with. Is it one off, like at one time, or is it updated continuously?

Respondent: It is updated quarterly. So, each quarter, they will release this data. Oh yes, another thing I forgot to mention, is that it is material recovery facilities, where a lot of mixed up recycling ends up or where people drive to, to put things in there. So, in there, there are lots of trucks coming in.

What they do, they also scan their number plates, so that they know that if this truck comes from this borough or this area, locate some of those tonnes that way and then they weight the trucks, so they know how much comes in. Then, all of that gets collected and they actually manually answer questions in the survey.

So, I guess, that process could be massively improved, because people have lots of typos. They mis-spell things massively. So yes, that was a big part of the job, to clean this data.

Interviewer: The data is only about volume or do they have any other kind of data?

Respondent: I can send you one example, you can have a look. It has got, also, information for the borough, they know what proportion of households subscribe to recycling of different kinds. They know who ordered a food recycling box or whatever. I can quickly have a look. Let me see if I can open one. I can send it to you anyway, but I…

Interviewer: Hmmhmm. What do you mean-

Respondent: I'll quickly open one by material.

Interviewer: What do you mean by proportion of households that subscribe to recycling?

Respondent: Well, yes, because not everybody recycles. So, in order to receive that service, you need to order the containers or order bags or something, whatever is in your area. So, they know which households, they record which households have subscribed. They don't provide that data to us, but the council,

they know which people complain regularly. So, they have got that information separately. I'm just going to have a look. Yes.

Interviewer: Did you visit any of these facilities, or are you just working with the data?

Respondent: Yes. A material processing facility. I went to the one in Wandsworth by the river. I think it is called Wandsworth Riverside Facility. They do groups, but mostly, school trips, for zero waste, about how to reduce the waste in the first place, and they invited people who are part of that, I don't know, movement or whatever you call it.

So, I went there and they also showed us that they had this separation conveyer belt thing, to separate the materials into different materials. I didn't see in detail, because it wasn't like... It doesn't look like they do visits. You can't really arrange that. Maybe if you are a school student.

Interviewer: Based on your involvement with zero waste, do you know of any interesting projects that explore this particular space of before things are sent to recycling? Anywhere rather than the Restart Project there.

Respondent: Just the Restart, because I think, with zero waste people, I would list the ones that I have been going to meet ups with. We can ask them, I guess, but a lot of it was more practical, rather than focussed on what they do with things. Can you not hear me?

Interviewer: Not the last 10 seconds.

Respondent: Okay. So, I was just saying that with zero waste people, I
                      wasn't aware of any data driven projects. It was more just a
                      community of people who talk about zero waste shops, or they
                      run clothes swaps, or they talk about making bags out of their
                      old clothes or whatever. You know, stuff like that. So, it wasn't
                      a very technical meet up. It was more just about household.

                      So, I think a lot of people find it easier to become zero waste in
                      their homes, particularly, because you can get hold of that
                      stuff, refills. At least, in my case, I would struggle, when I was
                      going into work and buying lunches because that normally
                      becomes a problem and not everybody can prepare their own
                      lunch all the time, take it into work. It is complicated when you
                      have to commute for a long time.

                      So, we just discuss things like that, rather than actual- I don't
                      know of data being collected about you, is if there is some kind
                      of social media stuff, you can probably do some text analytics
                      on people's conversations around it.

Interviewer: Yes, because one thing that I would be interested in finding out
                      about was how… there is this image, I wrote about it maybe a
                      couple of months ago, there is this role in France, in the
                      circular economy projects, there is the "valoriste", the person
                      who analyses what kind of materials are sent to donations or
                      even to recycling.

                      This person assesses the potential value of that and then
                      decides whether, "Okay, this pile of," I don't know, "Paper will
                      be sent to recycling, but these art books will be sent to this
                      library," and try to understand what is the potential value of

things. That is one of the particular spots in which I understand that there would be potential to use technology in a better way, because this role in France is very subjective.

It is one person that understands that some objects can be repaired or some objects can be valued in a different context, but it is not that easy to train a person like that. It is thinking about maybe create facilities for that or technology for that.

Respondent: Yes, I think with this data that currently exists, you can measure the value of materials, after they have been through a material processing facility. So, you would know that this much of aluminium was recovered. This much of textile was recovered, which is normally carpet, which is normally made of polyester. So, you would know how much it would cost, but you don't know before it goes in because it is all mixed up. In the UK, it is collected together.

So, it is called commingled recycled because it is all together mostly. Apart from, okay, carpet is separated. It is not a good example, but your standard rubbish is typically separated. In this dataset, there is also a reuse element.

So, for things like books or some white goods, like fridges and things, they measure how many were reused because council, they do this scheme where they repair it, then they give it to people who don't have much money or, the council tenant, they can offer them this reused product. I think books were also part of that. I can have a look for you in detail, because I think the materials, they can be quite detailed.

The chart that I sent you was more aggregated at total level and the biggest tonnes, of course, are from metal and big things, paper, whatever. They also do a little bit of the small things, like books and roads or buildings. So, there is quite a

lot of stuff in there. I will send you the dataset anyway, so that you can have a look. I have just opened it up. Oh, no, that's the wrong one, sorry. Yes, that is the wrong one.

Interviewer: I didn't know there was data about reuse. That is very interesting.

Respondent: Yes, in there, because when the council collect them, they also try to do things like that.

Interviewer: It should be-

Respondent: So, I can give you the facts off here.

Interviewer: Okay. Is it data all about objects or materials that come through the waste management, right?

Respondent: Yes, it is both. Some of them are commingled. So, they go via a waste recovery facility, I think it is called, but then some of them are collected already separated. So, for example, if you want to get rid of your carpet, you call the council and they come and collect those. So, it is already separate. So, that flow is separate from the mixed one.

So, you already know straight away, how many tonnes of carpet they have got and you know that that is going to be converted into polyester, in whatever proportion. So, you would know the value of that and then you would know also,

the carbon footprint of that because, if you know the tonne of material, then you can use a rule to say that as well. So, you can have quite a lot of things.

If I put a book into my mixed recycling, then the council have no other way but to just recycle this paper because they are not going to stand there picking out a book from my…

Interviewer: Not yet, at least.

Respondent: Yes, because it is all dirty. That is the problem. So, people don't clean their recycling, so it has got food in there. So, there is a lot of contamination. So, even a lot of paper that gets recycled, or some other things like plastic, they might have to be burned, incinerated instead. Actually yes, that is another thing. With plastic, a lot of it can't be recycled because it is all mixed materials stuck together.

Interviewer: Yes, I have two last questions. One of them is, how are you sharing or publishing the results of your research?

Respondent: I think it would put it on GitHub, because then that would make it available to my community of data scientists, because we have got WhatsApp groups and meet ups and things. Then, I would also write a blog about it, about the data and using the data. I might throw some charts in, you know. Yes, so that is probably going to go ahead as soon as I am more happy with the results that I have got, because there are still a few things to iron out.

Also, I have got contact with some people who have a graph database. They are basically like a company that try and advertise their database solution and if I write this blog for them, they will give me £100, which is not a lot, given the amount of hours I have spent on this, but it is something. Then, they would use this as an example in some of their training or some of their materials about how to use their database.

So, that would be disseminated further amongst my type of community. So then, hopefully other people will pick up that dataset and then maybe some more interesting work will come out of that.

Interviewer: Did you contact this waste data group?

Respondent: I did, yes, but they don't seem to be that interested in this work itself, they are just being quite helpful for me. Like, to explain to me how to use their data, but they don't seem to be interested in using my results themselves or asking me why I am doing it even. So, I think, maybe I am just talking to the wrong people there. I think maybe I will reach out to some of their management or somewhere like that.

I also was in contact with some of the people at North London Waste Authority because they are involved. They publish some reports, based on that data, themselves. They might find it useful. I just think that I need to finish this work first so that it is more correct, because unless it is correct, people won't have any trust in my work. Although it is correct for a lot of cases, because the dataset is complicated, there are still some things where I am double counting something or that kind of thing.

Interviewer:	Can you particularise by borough and compare the composition of waste in each region?

Respondent:	Yes, you can. There is only one challenge and that is more to do with how the structure is arranged. So, some boroughs… and the challenge is around the waste that is not recyclable. Residual waste, as it is called. Basically, the rubbish. Some boroughs manage their rubbish themselves. Some boroughs pull resources and a waste management authority does it for them. So, it is like an umbrella organisation covering a few boroughs.

So, when you have this umbrella organisation, you don't really know for sure what proportion of this rubbish is allocated to each of those boroughs. Do you know what I mean? Because it is only recorded at total level for that group of boroughs.

Interviewer:	Yes, I was about to ask you how granular this data is. So, it is…

Respondent:	Yes, so, at local authority level, but it also has these waste management authorities in there, which are not local authorities, but these umbrella organisations that manage some of the recycling and all of the rubbish for the boroughs it covers. It will have maybe five authorities for one waste management authority. In London, that is the standard set up and then some other areas as well, Oxford, for example. I can't remember.

There are a few areas around the UK where all the local boroughs pull resources for this. Then, you can't isolate the rubbish. So, you don't know what proportion is being recycled, versus put in a bin. You can only assume it.

Interviewer: Yes. My last question was a little more speculative. If you have any concerns, basically, on the experience you have so far, of in the future, arising questions about, I don't know, privacy and security, as the local authorities start to get more and more data from you. If it is from households and what kind of information can be acquired about people's consumption behaviours or even other concerns that you might have with data that is generated and people are pretty much unaware.

Respondent: Yes, so, for example, in our block, our commingled recycled is collected in transparent plastic bags, so that the people who collect them can see if it is genuine recycling or… some people use it for normal rubbish because, I don't know why. So, theoretically, you could take a photo of the bag quickly, and you would know roughly, proportions of materials in there, using a statistical technique, machine learning, something like that.

So, this technology is already available. It can be done. It is only not available if nobody is going around taking those photos or if they had more… because that is the level of granularity. Otherwise, if you have a whole truck level, or even the whole street level, which you can do, if you get access to the days… because you know which days that they collect from which street, right?

Then, in that case, the privacy is not a problem because the whole street is fairly big or the truck will go down a few streets

on a day. If you go down to that level of looking at individuals, then you would know, definitely consumption. You would know is there a lot of beer cans and alcohol bottles, you would know that. You would know if they have a lot of ready meals in their diet and stuff like that. I just think that currently, the resources are not there for governments to do that project.

So, I wouldn't worry about it because of that.

Interviewer: For now.

Respondent: Yes. Only if they start, I don't know. No, they can't use street cameras. They are not granular enough. I don't think the resources are there.

Interviewer: Yes, for now, I don't think there is any real reason for governments to try to start watching people's waste from that viewpoint, but yes, technically, it is almost feasible.

Respondent: Yes, but it is easier for them to watch what you are buying than what you are wasting.

Interviewer: Yes.

Respondent: Some people, they do put paper waste in there with their personal details and stuff, but I think now, digital fraud is more prominent, so nobody goes around anymore rooting in bins as they used to. Like fraudsters. So yes, don't worry about that.

Interviewer:	Okay. Yes, I have got pretty much everything I wanted covered. Do you have anything else you want to share about your research or [future 00:29:31]? You said that there is a blog. Where are you posting this, when you have it ready?
Respondent:	I didn't start anything. I was thinking to do Medium, because that is the one I see people use a lot. So, maybe something like that, then I don't know. Okay, so also, I'll send you that data as well, to remind me. I don't know. I think probably just a blog like that will be good to start because I don't want to barge into waste management authorities and say, "I'm going to tell you how to do your job," because I don't know enough.

I would need to research more about what they do, how they do and what they can influence and cannot influence. The only time when I have spoken with them, they seem to be focussing on education campaigns. That is the sort of things that they are looking at. Whereas, when I look at data science area, they are all thinking about using robots to separate waste better, but it looks like it is not that much better than what is currently being done.

So yes, I think you are right to focus on the area before it even goes to waste management systems because there is more bigger size of the prize there than… you know. |
| Interviewer: | Yes, the potential value that can be reverted to society is better. |
| Respondent: | Yes. |

Interviewer: Because they have them after recycling, when it is… you know.

Respondent: The other thing maybe worth looking at is charity shops, because charity shops, from my observation, and this is not scientific, I just looked at them, they throw away most of the stuff that they are given. So, they are supposed to recycle it, but I think the sheer volume of the clothes and stuff that people give and they don't sell, there are just big bins next to them or behind them that you can see full of stuff. The stuff that you see in there is crazy.

                    Big things like copper, really valuable things like that, like copper, artworks. Some of those artworks could be valuable, who knows. So, it is not just clothes as well. There is lots of stuff.

Interviewer: Yes, I was planning to visit. I have visited the charity shops here in Dundee, in this part of my research, but then-

Respondent: Now they are closed.

Interviewer: Yes, everything is closed. But then, I think I will try to contact those people because I am pretty sure that the groups that usually give things to charity shops are still trying to contact them and there may be something I can do about it for this part of my research, even online.

Respondent: Yes. I'm sure the volunteers who volunteer in those charity shops, they have probably still got time on their hands.

Interviewer: Yes, even more.

Respondent: Yes.

Interviewer: Yes, okay. Thanks a lot.

Respondent: Okay.

END AUDIO