I = interviewer; P12 = participant. Refer to DDM2020 dataset documentation for more information.

I so er yeah let's get going erm i asked you to identify in our email discussion a product that you'd like to talk about which had some sustainability relevance can you just tell me a bit about the product just briefly

P12 yeah sure yeah so erm it's the product i've recently kind of been working on and been designing it's er an electric vehicle charge point erm where erm a company called ((company name)) and we've developed charge point which has battery storage as part of the system erm so one of the big erm kind of barriers to electric vehicle adoption is that you require a lot of extra electrical er grid capacity erm at sites when you want to deploy lots and lots of charge points and if you if you it's called headroom and if you need if you need extra headroom you need to do a grid upgrade which is very erm time consuming and can be very costly erm so we've developed a system with with batteries which you can plug into a normal er mains power outlet erm and then because it it has batteries it kind of works like a water tower so it kind of is constantly topping up with the three kilowatts from the mains and then it can discharge a full seven kilowatt fast charge to two electric vehicles and you can have sort of as many of those as you want

I okay

P12 erm so it's basically an enormous box of batteries that charges electric cars fast

I okay okay and was there a project brief

P12 erm yes so i erm yeah there was there was a brief i mean we work a lot with government grant money

I mhm

P12 so erm we kind of wrote to brief ourselves if you like

I yep

P12 and then with it was accepted we got given some money and then we had to deliver it so erm and that

I so when you say you wrote it yourselves you mean your your company plus the company that you worked with

P12 er actually yes that's right yeah so we have internal we have an internal team who writes grants erm and apply for government money with cos there's a lot of funding with for sustainable design projects and sustainable r and d

I okay

P12 erm and we usually apply for a few and then win some of them

I yep and you had your client you collaborate with sorry you collaborate with your your client company at that stage in writing the brief and trying to get the funding

P12 so sorry just so to be clear this is an internal internally run venture

I okay

P12 so we we are we don't really work like a consultancy we work more like we're a venture builder

I mhm

P12 so and i am a kind of in house designer and engineer for some of the companies that we have created

I okay i see the company's already been part of yep okay

P12 yep

I and and what was your role in particular in the design of the product

P12 so i did quite a few things erm mainly because we take it like quite from quite an early stage to quite an advanced stage

I mhm

P12 so erm the erm the kind of electronics was done by someone else and then i came in to to erm i did some re rebranding and some graphic design erm for the company as well as the the product and i also did some indu i did the industrial design process

I mhm

P12 the current package package erm er i looked at waterproof things like waterproofing things like ergonomics things like how usable it was and basically how do we turn this kind of electrical system that we've got into a product that we could put kind of deploy out on the street erm for everyone and anyone to use

I mhm

P12 and i did once kind of that process was finished i then also did some of the kind of what i call design engineering so i i contacted suppliers i did cad design of the unit erm i also did a little bit of the kind of organising and the mounting of the internal electrical components erm and now with kind of a final stage we've been building it i've been part of the building process and we're going to kind of finish building in this coming week

I okay and how many others were involved in the actual design work

P12 er in the design work probably just me full time

I mhm

P12 and then some there was a senior guy who did the electronics and then a but that was quite early on and then i have a colleague a design colleague and he was sort of available to give me support

I yeah

P12 but it was pretty much all me

I okay so can you tell me about some of the things that you had to make design decisions about

P12 yeah sure erm yeah wow

I haha

P12 so some of the things we had to make design decisions about were the kind of trade offs between erm i guess how we how we would like it to to look and feel erm in our sort of dream world and erm the money we have the funding we have available and the time we have available so erm i had to make decisions about the erm kind of exterior of the body of the unit like how that was going to be made erm er so whether it was what material was going to be made of whether it was going to be plastic or metal erm and that had to take into account a lot of factors erm including cost and time and whether it was an off the shelf solution or whether it was a custom

built solution which we would have to get a quote you know to gain a quote for from a supplier erm so the material materials like and then also the kind of mechanics of it so whether it can with you know it has to have certain safety requirements like it has to be able to hold all of the internal electronics including the batteries erm and it has to be able to potentially withstand the car moving at low speeds erm because if you know if it gets hit by a car we don't want it to just sort of fall over and blow up you know

I right

P12 it needs to actually take a significant er erm so that was one that was one area sort of quite a big area then also i had to make decisions about the sealing was also quite important so we had to make sure it was sort of weatherproof

I mhm

P12 and there's sort of you know the degree to which you do that and how you do that is quite complex erm because you you can't you don't just want to you can't just make it a completely a completely watertight box erm because it needs er ventilation

I okay

P12 to keep itself cool erm so yeah those are those are some of the decisions i mean there's there's quite a lot of decisions

I yes of course and what would you say was the most important design decision in terms of sustainability

P12 ooh that's a good question erm most important decision in terms of sustainability well that's a that's an interesting question because this is a this is a product that i would say is kind of i guess systemically sustainable

I mhm

P12 so it in itself is maybe erm not what like necessarily people would call a sustainable product but it bit it facilitates sustainable er a sustainable future i guess

I yep yeah

P12 so probably the most important decision erm i we i had to make was in terms of sustainability

perspective was making the system modular and erm kind of easily repairable and maintainable

I yeah

P12 erm because that er that's the sort of most practical way that i could have i could affect sustainability within the product erm you know we want to be able to replace any and all of these bits

I erm

P12 we want anyone to be able to do it and we want it you know that to be quite an easy process so that it has a very very long life

I yeah

P12 and it doesn't just fail when the first component fails

I yeah makes sense and so i guess the material side of it was more difficult to choose sustainable materials

P12 yeah i mean i guess i guess again it depends how you define sustainable materials

I yea sure

P12 because the materials we've chosen are very very long lasting and durable they are i think they you know they do take a lot of energy in their production erm but then they last for quite a lomg time so it's a it has to be weatherproof unit so it has to kind of withstand the elements erm and yeah so the body the body of the unit is steel i mean i did make decisions like did

i really didn't want to go with a composite material erm

I yeah

P12 because composite materials as i'm sure you know very very hard to take apart almost basically impossible so then you're very limited within what you can do erm so we used we use steel erm for pretty much all of it which which was interesting as even though because we need some actu actually some wireless access erm so that made it slightly more challenging because we then needed to have an antenna going out of the box erm because er steel a steel box actually shields er a wireless a wireless antenna like wireless connectivity

I mhm

P12 whereas like a fibreglass container wouldn't have done that so erm but i decided that we really wanted to go with something like steel

I yeah

P12 because of the kind of negative impact of composites yeah

I okay so yeah you were you were considering sustainability at every every point then

P12 mmm

I okay and could you tell me a bit about the design process and how you went about making decisions

P12 sure yeah i think we might have touched on our last call

I yeah

P12 so i really for this i really like a process called morphological analysis which is where i essentially break down er the functions of the product you're trying er to develop erm or you yeah you break down the product the product into its kind of simplest basic functions

I mhm

P12 er and then you can combine those to create erm concepts design concepts that you can then assess on how on how good they are erm so i used this process quite early on erm and it was it was looking at things like how erm the sort of charging interaction as well so the there's various one one example is there's various options for how you how you connect to a car erm in this product so a lot of charge points just have a a kind of socket

I mhm

P12 and you can get your own cable out of your car and you plug it in and stuff but other another option is that it has what's called a tethered cable so that's integrated into the device itself erm and so that erm that kind of slightly improves the user experience but obviously with an added cost and an added design challenge and then it has to have a sealed entry into the box

I yep

P12 so anyway that and that was one of the things and you sort of look at well if you have you know if

you have a socket on the side of the box then that means you could have erm this kind of door you know it's gonna have a door on it erm if you have whereas if you have a tethered cable that means you couldn't have this other kind of door so you're just kind of combining

I mhm

P12 erm different possible options and then you're looking at those kind of final concepts for a variety of erm criteria including things like cost and erm safety and reliability and maintainability and and also sustainability

I mhm and no carry on if you haha

P12 haha yeah and then sorry what was your question was

I i was interested in the process and he started talking about this particular approach or tool

P12 mmm

I so how what does that look like are you doing this on paper and sketching or using a computer

P12 so you do yeah it's kind of on paper and sketching you do basically every every little basic function you do a little sketch for

I mhm

P12 and then generally speaking you you draw it up either on paper or on you put those sketches into a computer and then you put it into a huge table erm of kind of functions and then you you have them all going across and then you can just look at it and it's very visual

I yep

P12 about whether you want to combine certain things erm so i guess maybe a slightly better example as well is for electrical charge points is one of the basic functions it has to authorise access to users and you can do this with things like an rfid card an app erm you know someone sitting there telling you you can access it or none of those things at all erm and so that's again one of the basic functions on it and you can use you can choose any of those options

I yeah so you've got you've got all these options in a big grid

P12 mhm

I how do you actually then choose

P12 erm so it's yeah this is one of the this is maybe one of slightly controversial bits about the process is it's largely intuitive

I mhm

P12 or based on experience

I yep

P12 you know there are obviously certain combinations that work erm and certain combinations that don't so that helps you kind of guide the process erm er but yeah a lot of it is kind of its the kind of creative part of the process

I yep

P12 whereas it's very methodical to start with and then it's the creative bit is when you sort of look at it and go ermi think these should be combined erm and you do get some quite innovative combinations

I yeah

P12 of things but yeah it's been it's mostly kind of standing back and looking at it on a wall with maybe some with probably some colleagues and going through it and creating some concepts by choosing kind of your your preferred options i guess

I yeah and do you tend to generally agree with colleagues when you're looking at this and choosing together

P12 erm yeah usually

I mhm

P12 it can yeah it can it can kind of reinforce the way you want it to go before erm as a good way to do it because you can it's fairly exhaustive erm so you can think you can start it by thinking sort of okay i think i know the best way to design this product but sure i want to i want to try and come up with as many other ways of possible of doing it

I yeah

P12 and at the end even if i still do go with my original one

I yeah

P12 i am fairly confident i've thought of tried to think of every other possible way of doing it

I yeah yeah do you often find that you end up going with an early idea

P12 er occasionally yeah occasionally i wouldn't say often

I mhm

P12 erm occasionally and but again i think that's that's part of that's maybe part of getting better as a designer

I yeah

P12 erm because you get a kind of you get a slightly better feel i think for what is going to be the best option

I mhm and would you say that your own values influence the decisions that you make in design

P12 yeah yeah i would say so um i mean yeah that's an interesting question i think they do because you're sort of erm so i mean so but it's interesting to know where where the overlap is between values and between good design

I mhm

P12 so for instance i would say one of my values is that i believe everything should be like open access to all like you know product technology should be fairly equitable

I yep

P12 equally distributed erm and also that's a design principle so design is like a really good design is one that can be used by pretty much everyone erm so that's not very difficult for me to embed into the process erm so yeah it's quite hard to know er and i guess as a as a designer you learn certain what makes good what makes good design

I yeah

P12 erm i think yeah i think my values certainly around sustainability

I mhm

P12 probably are are definitely kind of embedded into the design process where other designers might not have those considerations right

I yeah okay and i guess for this design project what were the lines of responsibility who took responsibility for the final design

P12 er so that would be my kind of senior colleague who is our i guess you would call him our cto erm our chief technology officer he's a i think he's a he's a he's a he's been an engineer for a very long time he's in his late fifties erm he's kind of been part of many big projects before

I yeah

P12 he's got a lot of experience and i think he probably holds on to a responsibility for this particular product yeah

I so i guess that's responsibility for if something doesn't work or if something's not quite right

P12 yeah

I but who would you say takes responsibility building on that for sustainability in design or in this design

P12 erm yeah that's a good one i think probably that's pr that's probably me

I okay

P12 erm i think erm mainly because because i'm the the main designer working on it

I yeah

P12 erm kind of i have quite a lot of i guess influence over the decisions that we make you know my my line manager is a is our commercial director

I yep

P12 and so he will listen you know he'll he'll want justification for the decisions that are made but as long as i can justify them he's very happy to kind of go with what i what i i think is the right thing to do

I yeah okay and do you feel do you feel any personal responsibility for making the design as sustainable as possible

P12 yeah definitely yeah erm it's er it can weigh on your mind er quite a bit i think particularly if you if you maybe start to feel that er and i've had this in other projects actually where if you started if you come up on a new piece of research

that maybe shows that your design is not as sustainable as you thought it was erm

I mhm

P12 or actually it's not having the impact you want it to have

I yeah

P12 erm then you can actually sort of personally anyway i sort of start to feel a bit bad about that and you think is this really worth still doing i have i have spent my time well here have i made good decisions is this actually making a positive impact

I yeah and guess those situations might be because we learnt more about what's more sustainable or or because users aren't using it in the way you expected or

P12 yeah it can be either these things i think the example im particulary thinking of is i did er my kind of graduate project in my master's was a kind of solar lamp

I mhm

P12 and the idea was to kind of try and make solar technology useful and make it appealing rather than very functional and utilitarian

I mhm

P12 and i did design it so it looked quite nice but ultimately it was erm a very very very low power kind of solar unit which meant that the what you call the payback time so in terms of the energy king of recouping the energy that went into the materials that made the product would have taken many decades erm if at all so on a purely kind of er i guess energy balance level it was not really a sustainable product erm which i learned a lot from and ultimately but utlimately i felt a bit gutted about it although it taught me a lot and i kind of wish i had been a bit more rigorous with the brief i think erm

I okay

P12 or bit more rigorous and some of my early decision making

I hm okay and erm and the decision making that we talked about today for this particular project would you say that it's it's typical in terms of your approach

P12 my approach particular or the industry

I well firstly yours in in the situation that you work in

P12 erm yeah it is yeah fairly typical erm yeah there's a general i mean there's lots i'm sure you've noticed this there's lots of sort of design process models

I yeah yeah

P12 i guess this kind of creative technique that i've talked about morphological analysis would probably fit into the model that i use we kind of loosely use the Pahl and Beitz model of kind of design development you know like ideation concepts kind of prototyping erm yeah embodiment you know things like that erm so yeah it is it is kind of fairly typical i think we we particularly like early prototyping as early as possible

I yep

P12 as part of the process to make sure erm just it's good practice to make sure we know what we're doing is going to it's going to work

I mhm

P12 yeah i didn't know i don't really know how widely used i really like morphological analysis as a creative technique as part of this process because i think it is quite like i said it's quite exhaustive erm it allows you to be quite rigorous rather than rather than kind of just going with your gut which i think is very very kind of risky approach particularly when you're young i'm still quite young erm i haven't had a huge amount of experience erm and then to just say straight off the bat i think we should design it this way

I yeah

P12 is very very risky so i quite like morphological analysis because it allows you to be exhaustive

I yeah

P12 so yeah i do try and use that in kind of all of our projects

I but you don't go as far as erm using any of the tools that apply numerical values to different criteria and then try to take a more mathematical approach

P12 now we don't generally do that

er and that's a really good point i kind of i wish we could erm but it's i've never found a really good way of incorporating those into the design process

I okay

P12 because you're trying to on the one hand be very creative

I yeah

P12 and it's quite then it's then quite difficult to at the same time kind of start being very er i guess like scientific or very data driven about the process

I yeah

P12 and erm at the moment anyway i'd say that's quite difficult and i think another thing with that is things you know things like lifecycle analysis i find amazingly helpful when looking at existing systems

I mhm

P12 existing products but when you're trying to design something new it's quite difficult to gather that the kind of data you need about maybe all like i don't know how you do it maybe about all the components or about all of the you know erm yeah so that's we don't try and use numbers

I yeah

P12 as part of the process

I okay yeah that makes sense and then you mentioned a bit kind of difference between the way you work and the i guess the wider industrial design industry

P12 mhmm

I yeah i imagine you know you're in a position where you really can focus on sustainability and be involved in a process so imagine is really quite different from from the norm

P12 yeah very much so erm but i think you know i think it's for me anyway it's very important for me not to be erm i guess er really pleased about that

I yes

P12 in in in a lot of ways actually a lot of designers would really love to be to be working more sustainably

I yeah

P12 so much of it is determined by the brief

I yeah

P12 so much if you go work for a company and they want you to design the next plastic kitchen utensil

I yeah

P12 that everyone's going to want which is slightly slightly incrementally better than the previous kitchen utensil you're going to you've got to do that that's what you're paid to do erm

I yeah

P12 for the job i'm very very fortunate in that i have a job where i can work on kind of purely sustainable driven briefs

I yeah

P12 erm i think a lot of other designs would be like that opportunity

I yeah and what would you do if you were in that situation where you were having to design something not particularly sustainable

P12 well i have i have been there before i worked for a number of years for some sort of like three years in total for some other engineering design consultancies and consultancies are can be very difficult in that regard because you know it's not even your own company's brief it's the client's brief

I yep yep

P12 so you got to do that erm and yeah i do find that quite difficult i think at one point i was working on designing e cigarettes

I mhm

P12 and you know they're great on the one hand they help people quit smoking

I yeah

P12 erm but on the other hand they have quite high environmental footprint because they've got you know batteries electronics that you can't really

dispose of and need to be mined out of the ground and er but yeah anyways for many reasons i was not a big fan of working on electronic cigarettes erm

I yeah

P12 but yeah you know i kind of had to do it for a bit because that was my job and i was paid to do it i think it would be yeah i think it would be quite a tough move if you wanted and if you felt so strongly you know if you feel strongly enough about sustainability that you said i'm going to quit this job and i'm going to try and get another job erm

I yeah

P12 because it is quite a hard erm sector to get into

I yeah and and within those types of roles before erm did you see any opportunity to try and influence clients towards sustainability

P12 not at my level

I yeah

P12 i think er you are seeing that a little bit so i actually one of companies that i used to work for a company called ((company name)) but they were really good and they've actually just started to i think maybe in the past couple of years they've now got a sustainability lead who is one of their mechanical engineers

I yep

P12 erm and i don't know exactly how they are erm kind of influencing their decisions kind of the decisions in projects but i hope that they it you know sounds like he's taking an active role

I yeah

P12 i think you would have to yeah i don't know how you would do it i think except maybe cherry picking the clients you want to work for

I yeah

P12 so yeah they've just done a project with a company called ((company name)) i think who who do returnable packaging for food erm

I mhm

P12 i think they also just did a project on a solar er kind of home solar unit that sits on your

front lawn erm and so it's a you know it seems like they are as a consultancy trying to get more of these sustainable driven projects

I yeah

P12 but yeah i don't know how much sway they would have in other other kinds of projects

I yeah okay

P12 other than other than the all the things which are also like good practice so making making products that are erm actually i don't know if you have you seen something called the makers bill of rights

I mm hmm i don't think so no i'll look that up

P12 i recommend you have a look at it cos basically it's a lot of a list of princ very simple principles of sustainable product design and it's things like making it easy to assemble and disassemble

I yep

P12 using widely accessible fasteners er not using adhesives erm all these kind of things and so i would say a lot of designers try to stick by those rules

I yep

P12 erm even and that's a kind of small way that you can have an impact

I yeah okay i don't think i've seen that one i've seen a few kind of attempts at codes of ethics and things like that for design but it's such a kind of design is such a fragmented and diverse set of professions so i'm not sure if there's anything that's you know a sort of code of ethics for all designers doesn't seem to be feasible thing

P12 yeah

I yeah

P12 particularly when you start looking at things like graphic design and

I yeah

P12 print yeah engineering design and product design are quite different anyway already

I yeah

691 P12 yeah

692 I okay erm those are all the questions i had is
693 there anything else that you'd like to add
694 related to the topic or anything you thought i
695 might have asked but didn't

696 P12 erm ah yeah that's a good question erm yeah i
697 think one thing i would maybe like to add is not
698 it's just something i've been thinking about
699 recently is that the i've been quite i've been
700 kind of being quite careful recently to talk
701 about sustainable products because

702 I yep

703 P12 i should come to personally come to realise i
704 think that in a way there are no sustainable
705 products there are only sustainable systems erm

706 I yeah

707 P12 and products that kind of form part of those
708 systems because a kind of product that's
709 considered in isolation

710 I yeah

711 P12 is kind of by definition not a sustainable
712 product you know because you haven't thought
713 about the lifecycle of that product so yeah i'm
714 trying in my own small way to figure out how the
715 industry can kind of get a good terminology about
716 this

717 I yep

718 P12 because it's interesting how if you can google at
719 the moment sustainable products you get a lot of
720 very edgy things made out of cardboard and stuff
721 erm with with things with kind of an eco
722 aesthetic erm things that not not necessarily
723 things which are actually kind of systemically
724 sustainable so yeah i mean i'd be interested to
725 know if you if you come across that elsewhere and
726 erm come across a way of maybe

727 I yeah i guess the thing that we're seeing is the
728 circular economy concept and then people are
729 talking about circular design aren't they which
730 sounds a bit odd cos it kind of sounds like round
731 things

732 P12 round and round and round

733 I but yeah i know what you mean because even when
734 i'm sort of writing the title for the interview
735 you know email calendar invites i'm putting

sustainable design tell me about a sustainable product and i do i don't really want to simplify it to that extent but i need to say something to just because i also i also don't want to tell people you know what sustainability is i want to hear that from people i'm talking to and how they interpret it so yeah it's kind of shorthand yeah

P12 and as as as sustainable has become a kind of buzzword

I yeah

P12 it's er it's kind of been nicked by a lot of industries and products and campaigns

I yeah

P12 which are not necessarily you know not cannot necessarily rigorously make the claim that they are sustainable

I no yeah terminology is always a problem yeah

P12 yeah it is

I in anything really

P12 yeah i think that's that's probably it really

I great well yeah that's it from my side thank you so much for talking to me it's it's it's very useful to get your insights and hear about particular projects

/end/