Inclusion and Technology Design
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Lecture - 03
Are Technologies Gender Neutral?

So, in this segment we have 90 minutes. So, how we have divided the session? I will be speaking for 45 minutes, maybe not speaking for 45 minutes, I try to give some time for question answer. Then Preeti my colleague she will take over. And so, what I am going to look at is mostly looking at the artifacts and some of it I think Karen already mentioned in her topic that how technologies are gendered. So, they involving in certain ways and Preeti is going to look at more at the usage, Preeti is going to look at more at the access at the consumption stage of technology.

Now, I think the global scenario is kind of clear to you: what is happening with women in technology, like how many women are coming to do technology and what kind of impact that has on the experiences that we have with technology. And here again, I will start with sort of setting the context the way I did in the morning, that I am talking about that we need to look beyond the question of access and see how different groups of people can participate in the technologies that we are building, and what are the hindrances or what are the barriers for them to participate.

So, looking, accesses, I am not saying that access is not important, but access is just one small part of it. Participation is much larger context or concept than looking at just access.

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So, talking about the larger context I already mentioned some of this in the morning that how sustainable development goes says what are the such member development go and is gender equality in women's empowerment, and there how ICTs are considered to be one of the most important game changer like how they would be playing a very important role. And incidentally also this is a quote from one of our ministers, in the 59th session of commission of the status of women in the United State Nations. So, he was talking about that how enabling use of ICT tools in advancing gender equality and empowerment of women would be a game changer in this process.

So, again what I said in the morning that both of them are talking about giving women access to the technology, but before we even get into the participation part that is the last point it is its very recent it is in 2017 which shows actually the status of access to digital technologies when it comes to women. It is almost you know so women have, 33 percent of Indian women have access to any of these digital technologies in comparison to 67 percent of their male counterpart. So, it is almost half.

So, now, what do we do? The problem of access is not solved and those who have accessed are the participants. So, it is a double agent problem. Now, if this is the context we are looking at in Indian cases, I want to bring it I will basically pick up where Kerry some (Refer Time: 03:33) talking about few cases of the technology, some are old technologies some are new technologies which are now being developed. And how in

what ways gender sort of gets into the way of technology design so, that is mostly will be the focus of my talk.

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So, before we get into the cases there are as I said in the morning, that are hope is to give you some of this frameworks to operate them. Like, how did you get to understand that how gender gets into technology design or why it gets into the technology design question. So, this is actually many of us who teach use this reading. So, some of my students who are here might be already aware of this people that I am referring to in, by London we know it is a seminal article which is written in 1980, and the title of the paper is called do Artifacts have Politics.

So, he is look, the question is looking at that technology design or technology as such artifacts could be a flyover which could be a railways any of these big technologies small technological tools that you use they all have some sort of politics. Now, what do I mean by this? Then what; when I say that artifacts have politics or anybody wants anybody want to take a chance. What do I mean by? Yes, you can read what is written on the first point that is pretty much what is sums up.

So, politics not in the way we understands what political parties and government and all that because those are also part of the politics. But what we mean here that technology by design creates or cater to some kind of interest or some groups interest and when it sort of caters to a particular groups interest, it has the potential to exclude others. And this

creates the boundaries of inclusion and exclusion, for different groups of people and that is what I mean by politics of the world.

So, when we are creating this you know that is what he is saying that it regularly produces results counted as wonderful breakthrough by some social interest and crushing the others and that is exactly what Karen was trying to you know address in her talk. That how we do not do sometime these things intentionally it is not that the designers are the evil people are trying to you know they are trying to settle scores with women or any other group.

It is just that because we do not think about many of these issues, we continuously keep producing technologies which kind of exclude people or sometimes technology is also one of the reason of its exclusion. So, that is something also I want to sort of clarify, that as we said in the morning again that we cannot have or we want to move away from this cordial relationship between technology and social impact. So, we cannot even say that its technology alone cannot empower us technology alone cannot exclude us either.

So, sometimes what technological artifacts do that is the politics that we are talking about. They kind of reproduce the existing inequalities that exist in our society because we do not try to address those inequalities while we are designing (Refer Time: 07:17). So, then in the context of gender that is our theme today, then what are the two questions that we need to ask or we start asking. When we are sort of trying to evaluate what technologies are creating gender exclusion or gender experiences for that matter.

First is: what are the impacts that new technologies have on women's life and if they have different experiences or create different experiences for men and women, do they embody this in their material attributes. So, it creates by default different experience for men and women. So, these are the two questions that are crucial when you are looking at the question of gender technology and inclusion or exclusion.

Now, there are two ways in which you can think of this relationship gender technology and inclusion or exclusion. First, and this is what I am saying that when you are looking at technologies this is, we will also try to get to this when we are doing the more hands on sessions at the end of the day that how we evaluate existing technologies to ask these questions.

First is gender in technology and the second one is gender of technology. So, I am drawing one feminist science and technology studies scholar called Faulkner. So, she uses these two terms. And the first term means gender in technology, that when you are trying to find out the material attributes. So, what does a particular technological feature sort of attributes or creates this kind of gender experiences. So, I will talk about those cases, but let me just explain the concepts here.

And the second one is about gender of technology. So, sometimes when we create technologies, where we draw a regular you know our everyday experiences that I think one of you mentioned on the last session the problem of reinforcement that we reinforce some of those associations or stereotypes that we have like when Karen asked them what do you think that women do most online, many of us said or thought shopping.

That also sort of you associate women with shopping all the time. But, if you actually look at data I think men would be were doing more online shopping than you know women. But it is just the where we associate the kind of gender behaviour that we think that actually happens in our everyday life we try to sort of map that on to the technologies that we want to build.

So, if you want to build an E-commerce platform you would already have some pre-existing notion of what women would be interested in and then that is what you would put it in the design itself. So, this is what I mean by gender by association. So, it is not inherently it is this whole thing that anything that has a pink color must be made for women. I mean there is no inherent relationship between women and pink, right.

I mean it is not that we are born pink or not just all women would love pink right. But it is by association that you create this relationship between pink and women, that men will think three times before buying anything which is pink, because it sort of you know these associate themselves from their own gender. So, this is what I mean by gender of technology, that you create these associations over regular use patterns.

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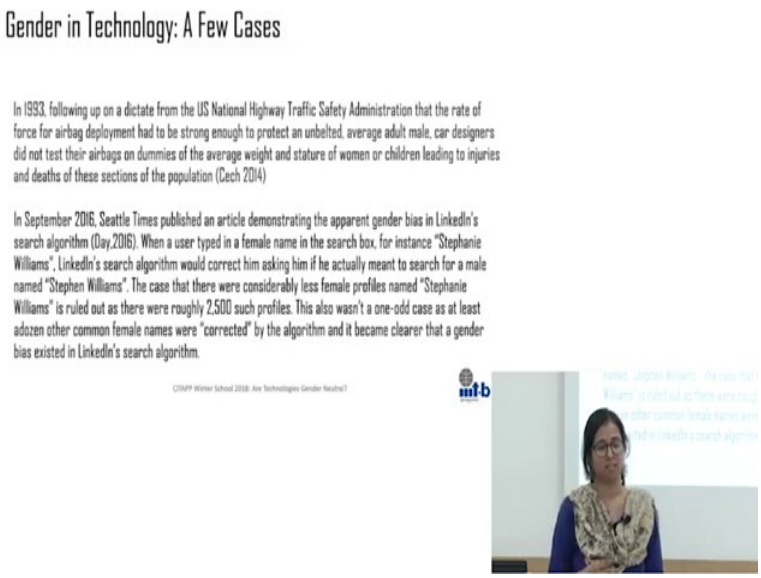

Now, let me sort of tell you what are these cases. So, as I said there will be some old technologies, there are some new technologies we will look at. First one is actually as you can see it is in 1993. So, it is a case of airbags that was first introduced in the US market and what they found that the airbag design was as Karen again talked about that how designs are already all these usabilities are soft tested on men, and then you miss out a large part of the population.

That this airbags were designed with only not just me, only bite me in their imagination or that is what they tested on. So, when they actually came in it had actually lot of people you know repercussions for women and also men of different races, what who did not fit into that white male sort of a configuration of a you know car user or a driver.

And one of the reasons is not just that women did not use, but you do not think of women as driving the cars. So, most of the time your imagination of a driver is that about men and hence you do not think of them as your ideal users. And what happens you build a batch which did not work for women at all. So, this is a typical case of gender in technology. So, it actually discriminate an artifact sorry (Refer Time: 12:50), an artifact which by default by design discriminate against women. Yeah.

Student: (Refer Time: 12:57) consider 80 percent of (Refer Time: 13:00).

Student: (Refer Time: 13:03).

Yes.

Student: Does not that justify that (Refer Time: 13:07).

Yes, I will come to that that is a very good question. It actually then what you are asking comes to the second case that I am talking about which is the LinkedIn case. This was reported in 2016. So, if you search for let us say this is exactly what this is, says if you search for a woman's name this is Stephanie it will auto correct it to Stephanie and they actually tested it. So, LinkedIn has a proprietary algorithm, right. So, you cannot get access to that algorithm.

But what they figured out by just doing it again and again with different female names that will auto track to a male or whatever the closest name is. So, they reported it and blocked it. And as a response LinkedIn looked at their algorithm and they fixed it. So, again, well what was this where was this coming from. There are most of the LinkedIn users which were looking for jobs or the those kind of job more men.

And, after this also there is another research which I am not sighting here it is that they found through some of this kind of you know looking at the use cases because we cannot get into the algorithm. That most of the time the highest paid jobs and higher paying jobs were advertised to male users a lot more than the same women or same qualification.

So, if for example, she is a computer scientist, the kind of jobs she would be advertised for or she would be getting access to us in comparison to her male counterpart would be a lot less (Refer Time: 14:50). So, these are also comes from the kind of data that you get. So, the data is of course, under represented and of you know by women and hence if you build make the data as the basis on which you are making this design, your design is going to sort of reinforce those bus, right.

Same thing happens if you look at credit score algorithms because women actually if you look at the history credit history women are always, women have not bought a lot of loan because they do not have property, they do not have you know collaterals and stuff like that they own less assets.

So, they are historically being not a very ideal category of you know population to give loan to. And because there are underrepresented in this data, if you use credit scoring

algorithms to decide who is the best person profile for giving loans women will always will have a less scope. And this is actually, this is why it is more important to understand this point and how it is different like the first one that we are talking about and the second one because first of all you would think of this designers not thinking about you know certain kind of users profile.

Now, as we are moving on way the technology many of the decisions are automated now. I am looking at a large datasets and some machine learning algorithms are supposed to calculate this. So, if you do not think of these things very early stage of your design, you are actually going to run into a bigger problem. Because your basis at which we are it is an automated decision right. So, and the basis is data. So, the kind of data you will feel the kind of decision you are going to get and that is the whole problem because as she already showed at a global scale the data will always have a very skewed representation of men and women, ok.

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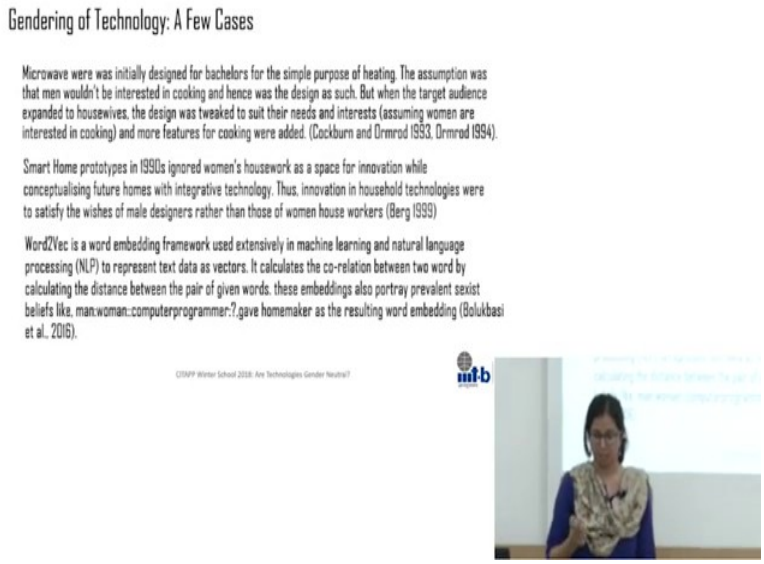

Now, the second case that I was talking about again, the first one is a, first one very old cases. So, microwaves when it was first introduced it was actually meant for bachelor men who would who could just heat up their food because they are alone, staying alone and they do not have anyone to cook for them. As soon as they figured out that they are going to launch it for women they had to sort of insert all those cooking possibilities. So,

the design by (Refer Time: 17:28) when they thought of women because men would never cook or men should never cook.

So, this is again it is not that what microwave oven you have now, there is nothing gender in the microwave, men can also cook women can also cook with the same artefact. But here the association is only because at one point it was thought to be a product to cater to women also that cooking was inserted. So, this is what I mean by association with the pink example that I was giving, right. That there is nothing natural about who not men not being able to cook (Refer Time: 18:04), they have the same abilities that women have that is required to cook, so but it just expected that they will not cook they only heat up.

Second one is again the smart homes example. That is early 90s when first smart homes prototypes were created the kind of innovation that took place in that domain one mostly looking at men's use of this technology. So, the kind of gender labour that men do only those were sort of innovated for. So, you try to bring in this smart home technology only to do think that men would usually do. So, women's work at home were mostly neglected.

The question here could be that ok, now that we have thought about this, this is very common, right. Now, smart home technologies do take care of lot of work that women do. Actually, there is when I met you, I went to the (Refer Time: 19:07) conference also yesterday. So, there was one person who presented a new anthropological study on smart home now, in Australia and they were looking at how the gender division of labour that was expected to sort of improve or that was promoted that it would improve I your smart home technologies women have, women will have more time for themselves if you have this technologies doing their work.

But they figured out this is her time being that as a result what has happened men have whatever little that they used to do at home they do not do at all, their only job now in smart homes is to maintain. So, if the technology stops working then they will go and fix it. Everything else is now woman's job. So, they have to manage they have all these smart homes technologies that they have at home to do their work. So, nobody is taking the burden of them. And what has happened, so whatever men were helping them before, excuses that you have a technology to take care of it now. So, you do not need me

anymore. So, this is how by association there is this inherent association that sort of you know goes on and we cannot break it with sometimes even bringing in technology there. There needs to be something more.

The last example which is a kind of tricky; so, I did not know that should I put it into the gender in or gender out. So, it is a combination, so it is the last case that I am going to talk about. So, is there anybody who does not know this what to ok. So, maybe I am not the right person to talk about it having so many computer scientists in the room, but its just to put it in a very simple way; that this is a word embedding framework which use NLP, maybe you should talk about it not me. So, they basically take the data large data set are put into it and they match two words in terms of their proximity to each other.

So, for example, if you put man and there is another word which is in that you know data which is king, so man and king would sort of go in together with, the pairing would be more appropriate pairing. And if you have a women appropriate pairing would be for example, queen. So, this is how it works. And it is a again it is a it works with machine learning tools. And so, one of the studies that I am sort of referring to, so this anyways would also be available to you, you can go look up (Refer Time: 21:54).

So, one of the things that it looks at they find out that the data is so skewed that they sort of reproduce this gender stereotypes we have. So, they put man and they put computer programming, so if you do the occupational categories and put men and women, so men got computer programming and women got homemaker. And there is actually a bunch of list, which I could not put because I do not have the space and also the time.

So, women had the pairing good work women would get homemaker, nurse, receptionist, librarian, socialite. And if you the same category would be if homemaker maestro for men skipper, protégé, philosopher, captain; so, this is how they would map these words together.

And again, it is it not that the algorithm itself does this pairing, it is again comes from the data that the data that they are operating on is something that the already under the present data or represent women and men certain things. And it continue to reproduce these stereotypes that already exists already. And by introducing this stereotype it actually gets embedded into the design itself. So, unless and until you fix this algorithm against the under representation or against the skewed data it will actually by design will

keep discriminating against women. So, that is why I have said it is a case of both that it is its gender of technology and which gets embedded in the design itself. Now, I do not have lot of time left. So, now, all these cases yes.

Student: Ma'am actually.

So, that is what I wanted to say. So, the point it is not I think maybe also the way I put it. It is not used to predict people's occupation. So, let us say you are using this tool to see how you have a let us I have these group of participants here, right. If I am using this tool to figure out what would be your background that, what you do in generally in life, right. So, because this type of mapping is already done, so if I feed this data all the basics of the existing data it will predict exactly you know the stereo type that already exists. So, a woman's, probability of being identified as a homemaker would be lot higher than a man being identified as a homemaker.

So, it is not just you are using it to predict people occupation. It can be you know just a sentence as well, that is really just if I find that in a sentence that is this word homemaker, as a sentence can we learn you know fiction book, right. If I find the homemaker, I will look for the both of them because that is how it has been already mapped. I think that is the point. So, it is not used to predicts peoples occupation.

It is this is the tool which is which is used across domain. And what we are I was trying to give you an example to the occupation that these are the kind of stereotypical mapping which is done, which comes not nothing, it comes from the data in this particular case. And exactly the point that you did that it is pretty obvious that more women are homemaker than men. But the point is it does not seem very obvious to the (Refer Time: 25:41).

Student: According to.

It is so obvious there is a technology, when you were designing this technology these obvious factors should be already accounted for, right. That I should know that this is what I am going to do, it will have an adverse effect, that I am going to reproduce the same problem that already exists. Does that sort of answer your question? All right.

So now, the question is that how do we tackle this real world problem; so, real world problem that there is a gender inequality, right. She also talked about it we all know it and especially if you live in India you cannot ignore the fact that there is a gender inequality. Now, if that problem already exists, can we what I started with, can we just make statements or can we just say that if you give access to technology.

If you give women access to technology the rest of the problem will be solved, it will not be because again technology will mirror the society in which it is going to be used. So, having that exactly when I started with, that having access to technology will not be able to solve women's or you know achieve women's empowerment.

If all these problems that are getting embedded because if you do not think about it. If you think that access to technology will make women empowerment this is what happens. These are the cases that is what I was talking about, the gender in technology that is something which inherently deters you to use it because of the gender and something which does not inherently deters you know by because of your gender, but it does an association. It is by association it considered to be better for one gender and not better for the other gender.

So, now what is what are the then; from here I will just you know wrap it up. Where do we then go? Like, what are the question that we need to ask for. when we are either evaluating existing technology design or we are trying to build something for our women. These are questions that I thought would be very important for you to you know going forward.

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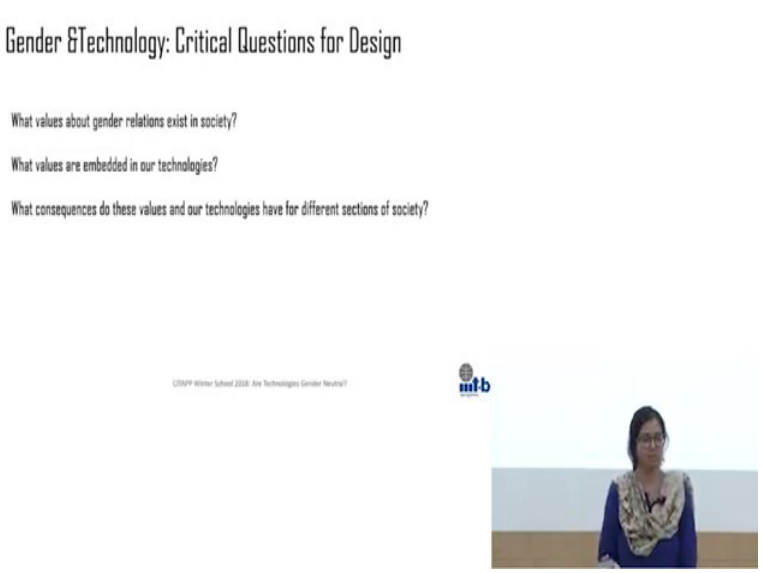

So, what values about gender relation that exists in society, and how these values are actually getting embedded into our technology design and, if they are getting embedded what consequences it would have for women or may be other gender minorities.

So, now if you are asking that if you start this, so if this is the steps that you follow then you will not just solely rely on data, when you write an algorithm we you will already think that my data will be skewed. So, I cannot as (Refer Time: 28:29) lady was saying that I cannot just afford to be gender neutral because when I try to be gender neutral, I actually become more gender because my society is not gender neutral. So, I my taking on this can make out the gender neutral.

And if you start from there then you consciously try to think about it that am I actually reproducing the gender inequalities that exist in a more may be you know amplified way or I am trying to actually shift those gender inequalities that exist via my technology design. And only when you think of that question this whole statement that we started with that give women more access to technology like as I was said 33 percent women have access to or possess any mobile technologies versus 67 percent women.

We can then think of that should we first think of giving them access or even for those 33 percent who have access to though how are their experience different. And that is where I think it been you know sort of tie down to what Karen says that missing women.

So, women are also missing out. So, why should they be even part of something that does not even take care of this or their needs, or their experiences.

So, it is sort of you know it is a recursive relationship that sort of follows. So, maybe going forward, we can keep these questions in mind and when we looking at concrete cases of technological or even trying to develop technologies (Refer Time: 30:08). I will just stop here. Does anybody have any question? These are the reading list. Yeah.

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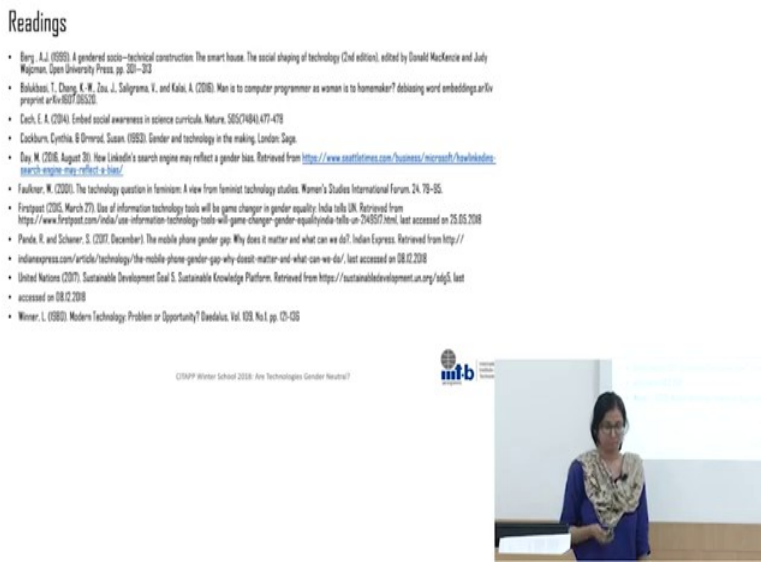

Student: (Refer Time: 30:15).

But, that is exactly the point I am talking about these are the (Refer Time: 30:19). So, what were the problems in doing some (Refer Time: 30:21).

Student: (Refer Time: 30:22) (Refer Time: 30:23) is the problem really it was the algorithm and technology (Refer Time: 30:21) or is the problem when we just how and trying to interpret the results (Refer Time: 30:30). So, I feel that huge volume or for the meaning these for (Refer Time: 30:36), it is actually it is not talking about mirror (Refer Time: 30:45).

Student: (Refer Time: 30:58) women, it is the same as let us say (Refer Time: 31:02).

We are just (Refer Time: 31:05). So, we are not using that (Refer Time: 31:05).

Student: Now, power dynamics (Refer Time: 31:06).

The point here that (Refer Time: 31:09) we are (Refer Time: 31:13).

Student: (Refer Time: 31:14) a sort of a you know the sort of (Refer Time: 31:15) sure there is a (Refer Time: 31:20), right. But in this case is (Refer Time: 31:21). My purpose was to discover (Refer Time: 31:24) in industrialization and (Refer Time: 31:26) it is like saying I have made the mirror (Refer Time: 31:32), society as a (Refer Time: 31:36) not I am as I am and I (Refer Time: 31:39) I should change the mirror. It is the solution changing the mirror or its the mirror actually doing this job and in the problem is (Refer Time: 31:49) I should be (Refer Time: 31:54).

It is not just about.

Student: Just to give a and also (Refer Time: 31:57) something to say about more about I have a question for you when you talk about the algorithms (Refer Time: 32:03) that is actually separating the black astronauts from let us say occasions. In the dataset what is the rates of the applicants need explicit or did it just come to that the applicants filtered out or actually, what is that matters.

(Refer Time: 32:17).

Student: Because if the race was not made explicit (Refer Time: 32:22).

Student: (Refer Time: 32:22) not approximately (Refer Time: 32:24). I used to work from bank and (Refer Time: 32:30), so generally (Refer Time: 32:32) suppose to do something (Refer Time: 32:35); even then this problem (Refer Time: 32:40) what you do for job and he was not because (Refer Time: 32:41).

Student: (Refer Time: 32:41). So, that is a point, right. So, any (Refer Time: 32:42).

So, people who are trying to (Refer Time: 32:45), all right. It is just that they do not think about it, that is what comes this is what comes back to you at (Refer Time: 32:54). You do not think women as rivals, it is the same thinking that makes reflected in the above as well as in the water vapour because you associate women with the particular kind of (Refer Time: 33:09) and that is the point I am trying (Refer Time: 33:12).

Student: Also, its.

It is not about you know whether. So, it is not as I said earlier also, we cannot think of technology either as transforming our life or empowering us, we should not also take technology as a villain here. It is not that it is doing all the wrong things for us. It is how we understand what is the potential of the technology, and then use it accordingly.

And then, think of its how technological empower us and are we taking care of all the other factors when we are thinking about technology will be empowerment. If we are involved then we might actually exclude people, but our intention is to include them that is the point, I think would be a, sort of I would sort of (Refer Time: 34:01).

Student: And to address the example you took of (Refer Time: 34:05), there is difference between looking at data as the purely academic pursuit and using the data to actually do something to. So, all the examples.

Student: So, the problem is with when we move when we when we derive a wrong information where we (Refer Time: 34:20).

Student: No, no that is the thing, right. So, most of the examples that are given we as humans interpret the data and say this looks right, this looks wrong, but that is not what happens in the industry. What happens in the industry is that the machine learning algorithms they make the decisions based on what they learn without any supervision.

Student: (Refer Time: 34:38) can I ask the (Refer Time: 34:42) responsibility and (Refer Time: 34:45).

Student: Yeah, (Refer Time: 34:47).

Student: Ma'am, actually writing algorithm is actually tell what is (Refer Time: 34:53).

Yes (Refer Time: 34:54).

Student: (Refer Time: 34:54) you are getting, you are getting instructions to the (Refer Time: 34:58) saying (Refer Time: 34:58).

Student: There is another big problem with updating algorithms to the tradition says anything later good machine learning an algorithm (Refer Time: 35:07).

Student: Yeah, yeah.

Those who are completely (Refer Time: 35:08), I did not recommend this video by (Refer Time: 35:12) for artificial intelligence, it is really mind blowing and you will be really worried. I will give you (Refer Time: 35:18).

Alright. So, that exactly brings me to the end of my 45 minutes. Preeti over to you.