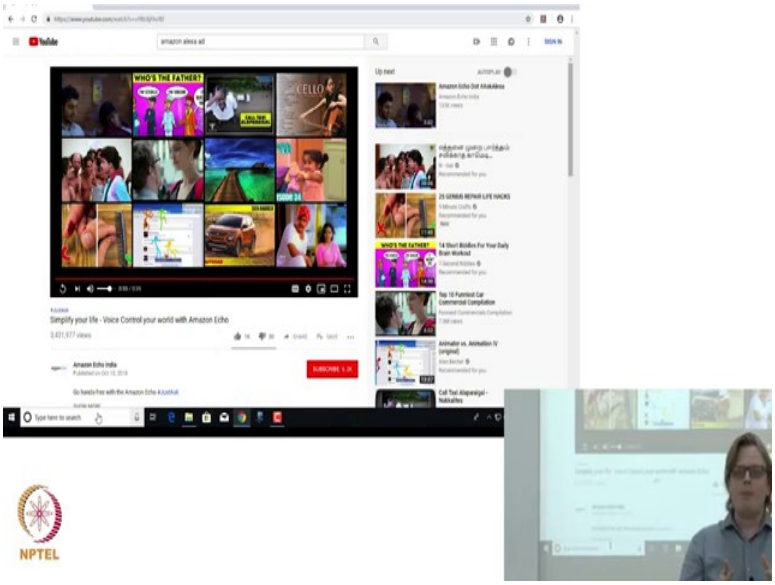
Inclusion and Technology Design
Indian Institute of Technology, Madras

Lecture - 13
Assignment Videos: Design Jam

So, let us get back. Can I have your attention for few minutes? I know you are really working hard because you have left with until last minutes not what you (Refer Time: 00:21) breaks in the lunch but soon working now, but that is alright. So, I think you have already started on this and I will give you so little bit more time for some questions that I have given you.

But before that I just wanted to give an example of a technology that is; let us say an upcoming technology there is a way (Refer Time: 00:43) and that we have several people who have done a little bit of research on here. So, I want you to give an example of how we can think about one of these technologies.

(Refer Slide Time: 00:54)



Let us see if I get this in full screen.

Alexa play [FL].

Ok.

Alexa, volume up.

Alexa, give me an applause.

Ok. Amazon Echo music information and more. Just ask.

Right, so increasingly we are having voice interfaces built into well all of our phones, most of you people use a smartphone and several devices Google home, Alexa and so on. And you can give also to face with them; this guy plays a music and his wife use it to express her gratitude with (Refer Time: 01:57) applause.

But and these things one of us to kind of a new interface that is come into our living rooms, into our phones, into all of our different spaces and they allow us to do all sorts of things. The primary modality we say a modality as they modality as say ways to interact with the technology right. So, primary modality of this is through the speech interface, where we can hear spoken voice and the microphone that can record and then run as model and interpret it what we are asking it just do that.

So, it sends on what account may be it of choose a cloud server which analyzes what we have said and then tries to figure what kind of things that we want to do. And, as I am just pointing out previously, a lot of these kind of technologies have actually emerged from assistive technologies. So, we had of this speech to text assistive technologies and from there we have now gotten mainstream technologies that are that show up in our living rooms and our smart-phones and so on.

So, let go (Refer Time: 03:07) and presumably if I were you my expectation would be the wide mainstream emergence of these technologies should make life easier for a lot of people. And presumably should support some form of the digital inclusion; can you give some examples of how these gives support an inclusion?

Student: (Refer Time: 03:31).

How this kind of technology could serve to support inclusion or participation with technology?

Student: There is navigation (Refer Time: 03:39).

You can elaborate a little, it will make some (Refer Time: 03:43) for whom.

Student: (Refer Time: 03:45) along the just by saying ok Google, it will the same image.

And that makes it is you are (Refer Time: 03:52) because?

Student: Because then it because a smart-phone is a new thing for a navigating (Refer Time: 03:58).

Ok yeah, so it can help people maybe I do not know about your dad; my dad he sometimes struggles with technology. And he is not brought up with technology, so it could help your, so barriers in terms of your experience with technology yeah.

Student: Before this derives comes either; we think its Google maps. So, that was mostly (Refer Time: 04:21) so I can see; it is map is like when I see all of this distance is (Refer Time: 04:26) check the preliminary fully mapping. So, now I can ask Alexa Google tell what is the distance between Bangalore and Chennai right. And I can also ask what are the places that I have to crossed if where is the tollgate, where is the (Refer Time: 04:40) in mapping. So, I can say that the clear picture in my mind from Chennai to Bangalore.

Yeah.

Student: (Refer Time: 04:47).

Yeah, we have some WhatsApp.

Student: With the interaction of this is; what I have also found (Refer Time: 04:53) little; it becomes easier to the (Refer Time: 04:57); to form while this is using you just (Refer Time: 05:01) much easier and probably now 18 years that is; that is what I.

For different kind of apps or?

Student: Yeah for navigating through the phone or we use it as a (Refer Time: 05:13).

So, its provided a new modality to the phone right; it is a phone which previously had modality with touch screen, multi touch interface would be the initial modality and mostly using text, suddenly we have a new modalities started off yeah cool.

Student: Yeah, also literacy barrier (Refer Time: 05:32) people know English can speak English, but many of them cannot at least in part of this local languages; many of the people are bad at writing and most of us are definitely are better speakers than writers. So, that way it make everyone's life easier.

Similarly, it gives us to reduce a literacy barrier both in English or, but in any language; this supports lots of different languages some analogies. And, that sounds good, like we have technology that allows us to over cross certain barriers and provides opportunities, a lot of opportunities really. But I really like to have few critical voices and we would had a bit of work on this; me and Vidisha together with one of our students on specifically these kind of voice technologies. Maybe can you give some examples from that of how perhaps this has a lot of opportunities for a (Refer Time: 06:24), but maybe there is some other.

Yeah, so government will be powerful with (Refer Time: 06:27) that safety and currency (Refer Time: 06:32) so one of the two a main purposes for which both men and women will use voice is purpose of travelling or bookings on phone. So, they found there is specially women who are working and also use public transport they did not feel comfortable using the voice app (Refer Time: 06:52) in spaces will be could be heard by other people who are not their family members, this is where there is a public space.

This is concern of private security mostly and safety, but within the home spaces; what we found we actually did a study among engineering students who are all girls. So, they come from sort of privileged background and for them they for them the notion of space was also very important, not so much in terms of security and safety; that is I think concerned across all classes.

But also what the content that they are searching for using voice; so and one of the advantages that we had the student who was doing this research she was a girl. So, a lot of things that they could open up to that the kind of content research which are usually prohibited or there is a kind of social you know stigma that the girls should not search this kind of content.

But how is it different from searching (Refer Time: 07:52).

So, what we found for them their understanding this did not come through in the interviews that we had with the male representative; that they are extremely alert of the space and context in which they are searching and what they are searching. So, there is a direct correlation between the content of the search and the context of the search; so in that they in all across all circumstances.

So, why I am gave these two example that irrespective of whether it is a private space or it is a public space this notion of space is extremely important for them to make a decision; what is a content that they do research for. And this was not so much I am not saying that it is a binary that male did not think about the context of course there are.

Student: (Refer Time: 08:39).

Specific example.

(Refer Time: 08:42) example.

Yeah. So, as I said that they would not if they are in a public places let us say if you are in a bus stop or you want to book a OLA or even public space you want to book a OLA; they do not want to use voice. Because they do not want people around them to know what is their (Refer Time: 09:00); if they want to search content which is very private right.

(Refer Time: 09:06)Alexa.

Yes, exactly which should be safe for male. Right, I am not saying that.

Yeah.

Male do not have (Refer Time: 09:14) content to search for, but irrespective of where they are public or the private their understanding or their alertness to space content relationship; we found way higher than their male counterparts. So, this one thing that we found about them (Refer Time: 09:31); the another thing that we found about that I think this is also very well researched already (Refer Time: 09:35); a lot of people working on this.

This whole quotient that we have about male in this, Google also started I think last year they made up of 14 Indian languages available for voice search and this was one of the step that they took towards being more inclusive to people who are not comfortable in English or people who are a low level of literacy group. What we found actually on the content peoples who had; we are not talking about illiterate people; we are talking about people who have the; their level of literacy is very low, they are not very comfortable in reading and writing; it will show you how to spell these.

(Refer Time: 10:12) rules are all imposing (Refer Time: 10:13).

It is not imposing; it is about also what you understand that you are just giving access to vernacular language is not inclusive enough, it also depends on context. This might not; the same context might not apply let us may be, I do not know somewhere England and America. But this in English or English being a status symbol; English being an aspirational language, it is very specific to maybe a postcolonial or British colony; it could be French in some French colonies. So, there is an aspirational category to language; which send sort of break the assumptions that we already made before you know thinking that ok this will be.

(Refer Time: 10:52).

You want to talk about this.

No, I just say one of the assumptions of these have been designed it and a lot of the emphasis have been traced on it has been on creating the ability to speak to it in vernacular language that being part of (Refer Time: 11:06) effort and if we say the English is an aspirational language and actually people prefers speak in English; then maybe that efforts will be better spent in understanding mixed languages.

Yes.

So, the people could speak in English and then insert a few Hindi words where they did not know the English word. So, maybe (Refer Time: 11:26) the device speak Hindi; we could choose device to understand mixed more languages because people.

(Refer Time: 11:32) accents, I mean there are so many videos some accents with (Refer Time: 11:37) things and all.

Yeah.

Then it is not (Refer Time: 11:40) yeah. But this mixed language will be (Refer Time: 11:43).

Google; Google has an Hindi and English.

(Refer Time: 11:45).

Because we have worked with people of specially among urban youth and they are sitting up their class; none of us use a pure language. So, all of us most of the Indians are bilinguals right; so, all of us always speak in two languages simultaneously.

Yeah (Refer Time: 12:10).

Yes, exactly.

So, (Refer Time: 12:14) and of this we did (Refer Time: 12:17).

Yeah, so there is no pure language specially in urban area maybe rural area is a reality will be different I do not want to comment on that, but that is what have found; nobody speak in a pure language. So, that is something would be a you know context specific learning for design; that this is the particular reality of India and specially urban India.

Yeah even in a one line.

Yeah sorry its.

And, if you speak one line means I think there were some words, you cannot find replacement.

Yeah, you cannot like.

And one of the things; just think that how these technologies operate as exclusions, once barriers you know hits a barrier; you cannot use that just stops (Refer Time: 12:56), that is one thing right. They keep the technologies the activated six (Refer Time: 13:00) right, that are actively designed for toys designed for boys; this is only for boys saying that they playing on the social norms resist you use by other people.

But a lot of exclusion (Refer Time: 13:14) purely a blind spot; it could be in this way a blind spot to the factor mixed languages more important over aspirational nature of English as a poster you design for the (Refer Time: 13:27); that we have these users, who only speak in Hindi and should use this device only in Hindi or in Bangla. But in doing that we may miss the facts that in fact, English or mixed language is much more will be a much more inclusionary choice as a design.

So, blinds; so exclusion work like that yes. It can work in a sense what do you focus on; what do you emphasize and what do you not, I thought that (Refer Time: 13:55); say I think you have done a little of work on this, on this things as well. So, maybe I just thought maybe I should share the microphones.

(Refer Time: 14:03).

So, for us at (Refer Time: 14:06); we are actually building a skill or application on Google assistant and Alexa. And, (Refer Time: 14:14) was trying to understand what are the upside and downside for people with disabilities; I think this personal assisted power devices whether it is a speaker or a personal assistant application like a Siri or Google assistant on mobile phone they are very useful to people with disabilities.

And, I think it does help in reducing many small little barriers that one encounters on a daily basis to let them do that more independently ok. So, for instance a person who has a locomotive disability; I think a home automation which is linked to a personal assistant device; it is a very very beneficial in terms of just navigating or ensuring that you know the lights are turned on or off.

For us it might be a simple thing or something for which you need not give a lot of thought, but for a person who has a certain disability; it might be a project in itself who cannot turn on and turn off the lights or just put on the curtains or not. Just by having a home automation; I think it can significantly help them in term of reaching there. I have also personally seen in terms of the quick information as a you know blind person or there is a quick action for which see my when I am using a screen (Refer Time: 15:30) on my phone; it is far more lengthier, it takes a little more extra time with the time I am achieve those tasks much more efficiently much more quickly.

What I have also seen many of these devices are all application I want to call it, these are a platform and they become mighty moral. So, earlier in one of the biggest criticism for this voice enabled application was that they are not inclusive for people who have hard of hearing or people who are deaf.

Now, last year Apple enabled void text typing on Siri and now also if you see in Google they are supporting multivolume interaction, where you know you can actually carry forward the conversations of a speaker into your mobile phone applications. So, you

come (Refer Time: 16:18) conclusive and I think they agreed to execute small tasks such as making a payment vow; I have often use Siri to make a Paytm transfer perform a easily and no doubt swiftly which the major application of Paytm is not really accessible. So, it is actually make things much more inclusive for me, it has (Refer Time: 16:42) where you know which was earlier was not using (Refer Time: 16:45), now that they are think they are on a platform, they are they work they are living there.

So, it is becoming a much more inclusive. So, I think there is a lot more upside; I think I specially see a lot more focus of (Refer Time: 17:02) think cases of learning is reached perhaps (Refer Time: 17:07). But here there is I think there is a lot more can be achieved in terms of education for people in the (Refer Time: 17:15); every time is not matched yet, but then it can offer a lot of potential. I definitely see a challenge in terms of a learning curve and you know while it is largely (Refer Time: 17:28).

But people with certain intellectual disability who have development issue for them to train them and how do we make sure this machines understand their style of speaking something that we need to manipulate look; obviously, and the potential eagers for if you have found out for this case.

Nice and I just wanted to finally highlight one thing; Anil gave us a lot of potential for this devices. Now, its important to think also Vidisha said about the gender too; you cancel gender related issues because, you can have the potential for this device to give you the directions where to go, or have to navigate your OLA app and that is great.. But, if you same time have the fact that women may not feel safe in public space and be very aware of public space then that potential may be lost because, then you have the intersections.

Let say you are wishing pad; few are say who would you use that bus software trying to find out the direction that they go; that intersections is also very important to consider that you have the intersection, this intersecting edge of you can say intersecting exclusions in some senses; where each section is intersecting challenges that needs to be done.

Student: But, that can be taken care of.

That can be taken care of, but you need to pay attention towards; to the fact that they are all these intersecting interface. So, if you think that a voice interface is matching the economy so issues for visual impair cases but you do not take the question of gender into accounts. Then you are probably not going to create exclusion; that works for that intersection.

Or if you take intersection needs of learning various as to learning impairments or difficulties, then combining that with other things. Again the technology may not serve as (Refer Time: 19:23) purpose alright; I am going to give it up to you yeah.

Student: One small.

Yeah.

Student: Like most of us type right; if we had been typing for long enough, we do not look at the keyboard right.

Yeah.

Student: So, we could actually have a keyboard that would tell you which letter you press ok; after you press a letter and you could have visually impaired person put on earphone; so they know what they are typing if they have been practicing that for long enough. So, they do not have to tell it out loud and at the same time they exactly know what they are asking for from the applicant it be overall Uber, Paytm.

Correct.

(Refer Time: 20:01).

Can I just ask you one question? How much do you know about how visually impaired users uses smart phone right now? How much do you know about how users with various visual impairments use the smart phones right now?

Student: I do not know, see I do not know much, but I just thought this would help out; I did not I am not saying.

I am not peeking on you, but I am just telling give an example because this is like typical sentiment. We have a technology, we have a modality, we say this could help in this way

ok, but we saw I think already what you find anywhere you go. So, I work; I have not worked in this field; I worked with (Refer Time: 20:41) firm right.

So, there are many people go there and say we can create this technology for their need, but what you find if you actually go and spend time and actually listen and look at what happens; is that there is already a appropriation of technology. There are already features may be not even designed for accessibility or maybe not designed for the idea of(Refer Time: 21:05) that gets appropriate or ready.

So, when you think about this; oh this can help, this can help you have to say stop myself for the experience. And I say let me first look at how people are already making use of this; it is probably they have already found features with other part for that. Or they have other ways into it or maybe there is nothing to do at all; in the (Refer Time: 21:27); they had an example of somebody who had developed a keyboard where they show impairment in mind and I am going to paraphrase this example.

But the idea doing that people are buying (Refer Time: 21:38); who have vision impairs cannot use structures and that assumption itself is absolutely wrong, I mean and so you start from a flow of assumption. If you start from insufficient knowledge of how people are already appropriating can't you make it work for themselves, the risk is that you at best waste your time ok; at best you waste your time and you waste recourses that could have been put to so much better use.

So, I am not; I am just going to say it that instincts that we often and I would say as an engineer; for me that is an engineering instincts that instincts that we have this technology, we can make it work for them. We have to stop at the design approaches to stop go back and think ok; first let me figure out how people are already appropriating this technology. Then I can think about how we modifies and so on ok.

Sure it commence, but I want you to get it is to working on this cases that I have given you. And many of you have already identified certain things, certain barriers, you have thought about who this was designed for and who this was designed (Refer Time: 22:48); you may have thought about certain social norms that have been embedded in this applications. I mean a silly example; you know about how social norms maybe embedded in these things you know; we have this BIC pens for her on Amazon, that are

pink BIC pens because; obviously, women need BIC pens I mean this is a very silly example.

But social norms get embedded in various ways in these applications. So, I wanted you can pick that one; I will give you 20 minutes in your groups. You have resources here where Ankith has been very graciously spending his time. So, he is a great resource for you guys, to think about how this technologies operates, or where they may lack in accessibility where they may not. You have me, you have Vidisha who has also worked in some of these things, so you can use us as resources.

But also work in your team to identify these four areas which I have said and then if you feel that we have an idea, this is the barriers. Then try and think about it, ok what might be some changes that we could start that we could try; what could be something you could prototype here you think about what we might see or change, what could be potential modification.

Now, remember the trick is to stop yourself a little bit and say, here are some potential things we could look into ok; not knowing we should we decided in this way. Because you probably do not know right, but think about what could be some of the modification needed. So, I will give you a yeah; I will give you 20 minutes to do that; I think we still have 20 minutes. So, you can get into your groups and you have 20 minutes to finish off the work you did and think about what could be some directions we can go.