

Inclusion and Technology Design
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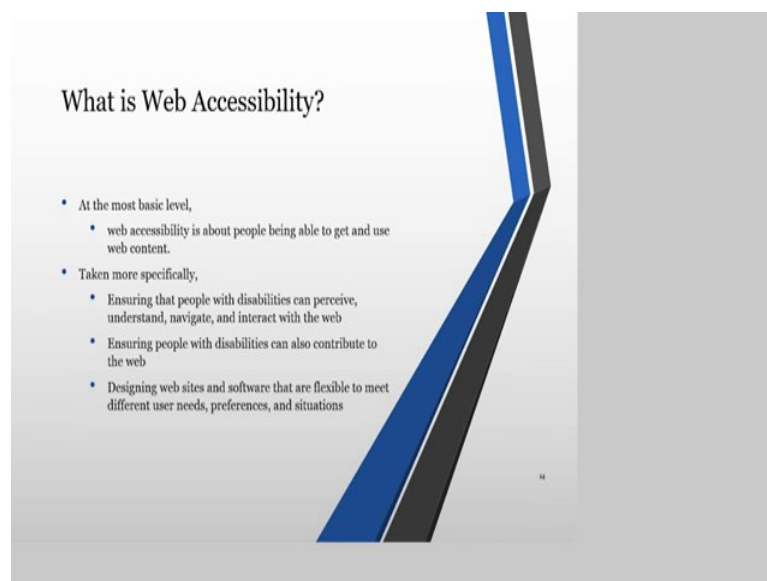
Lecture - 07 Part 2
Accessibility Fundamentals: Disabilities, Guidelines and Laws

So, I am going to talk about web accessibility. So, just replace the term digital whenever I talk about web, it is more an digital accessibility now than we are talking about web accessibility anymore. So, what is web accessibility? At the very basic level, it is how people can use or get information from the web. So, if you have been seeing in the web from long time.

Student: (Refer Time: 00:43).

From early 2000 and at the end of 90s, it is more a web is a static page. You just click a link, and you will be taken to some other page. It is more hyperlinks that at that come together as static web pages, and you just used to read the information get information on the web, but it is no more static web pages, we are having more sophisticated and more interactive content on the web.

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What is Web Accessibility?

- At the most basic level,
 - web accessibility is about people being able to get and use web content.
- Taken more specifically,
 - Ensuring that people with disabilities can perceive, understand, navigate, and interact with the web
 - Ensuring people with disabilities can also contribute to the web
 - Designing web sites and software that are flexible to meet different user needs, preferences, and situations

So, we are interacting we are not just passing or looking at the information on the web, we are interacting to the web and we also contributing to the web. So, many of us would

have been contributing to the web in a various ways. Can one of you give one example how we are contributing to the web?

Student: Submitting data through Google forms.

That is one, yeah.

Student: (Refer Time: 01:37).

Trust me all of us are doing it.

Student: (Refer Time: 01:42).

Absolutely so.

Student: Posting content on a social.

Social media like you have Twitter, I suppose all of you will have Facebook and Twitter accounts and most of us know that is interesting.

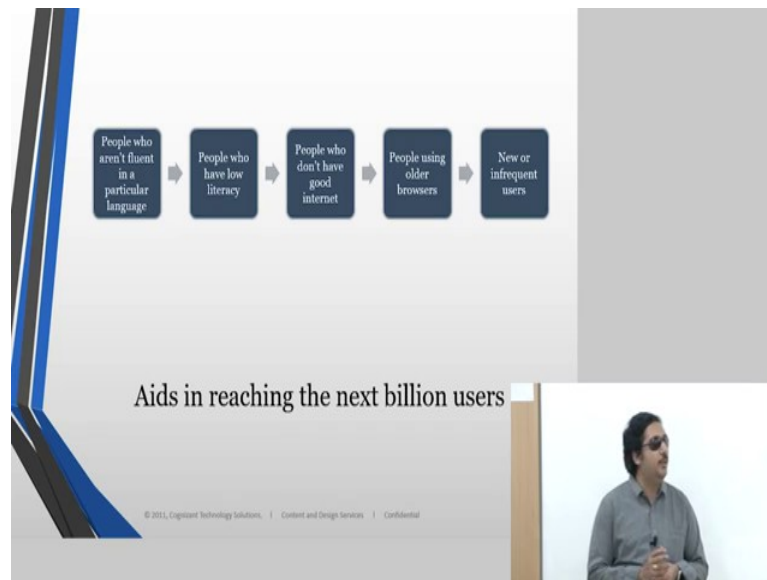
Student: Somebody saying blogs.

Blogs, absolutely, yes.

We are submitting information, we are sharing information on the web, we are contributing to the web, but that is how we that the era has been changed just by looking into the web to contributing the content to the web, and the interaction. So, when we talk about web accessibility, we should be able to use the content, interact with the content, contribute to the web content.

And on the other side, we see that when a person he is able to perceive, understand, navigate and interact with the content, it substantially would be accessible. So, perceive, understand, navigate and interact the web it is substantially accessible. So, there are much more to these four methods of using the web, but we will be talking about that soon.

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So, then what when we talk about web accessibility the next thing we want to understand is why we need to have web accessibility. The the reason is so simple that we talk about persons with disabilities are the most one's who are using this technology. But is it only just the persons with disabilities, it is not necessarily because there are so many other use cases that impact the digital accessibility. Something like you it is as simple as if you are making your website accessible or app accessible, it is more usable any of any one of us can use it.

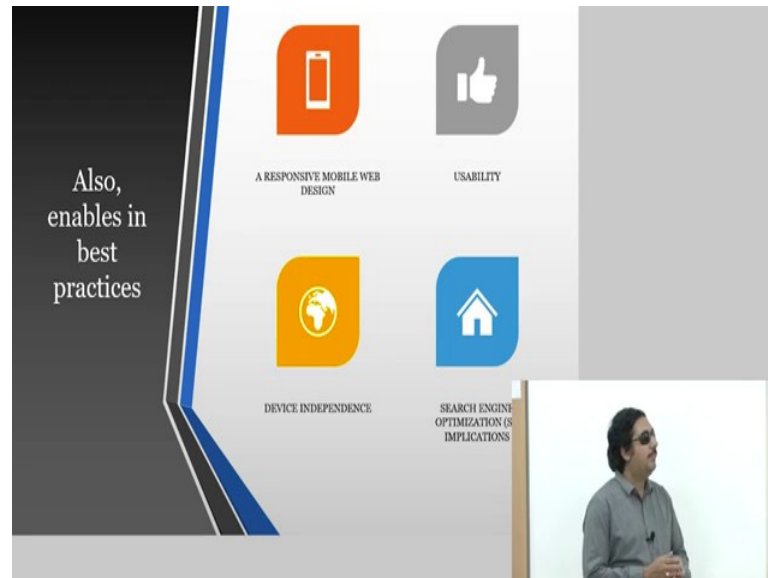
And see you people are being using your mobile, if you are on a side of the road, and you want to book Uber or any other type of system like Ola, the biggest challenges in the sunlight you might not be able to see the screen as brightly or easily as you could. But if you are making your website accessible, we are ensuring that this website is usable even in sunlight not specifically we are targeting at the sunlight, but we are targeting a people with low vision.

When these low vision users accessibility needs are met, it is more brighter and much more useful. And when we are doing the usability test we also ensure that the high contrast mode when we switch on the high contrast mode similar application is usable.

So, the accessibility features built into the applications are also taken into consideration and to ensure that all the users irrespective of their abilities are met, and also the features that are built into the operating system are also useful, usable with the application so

usability matters. When we are doing web accessibility, there are fundamentally four breakpoints that W 3 C have defined that says when you are making the application or website accessible, it is having four impacts, one is the business or the market.

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Because you are making your website accessible as we are mentioning about 15 percent of additional population who are using it. It is already available for them, 15 percent of additional market reach. And, when you are making your applications accessible, it is more you giving more importance to the innovations, innovative solutions to ensure that everyone is using it.

These innovative solutions will increase the market reach in terms of other aspects other use abilities. So, I can give one example. So, recently I have gone to this summit called India inclusive summit, and I have met one interesting startup.

(Refer Slide Time: 05:54)



So, who are working in the space of autism. People with autism have trouble understanding the information or getting (Refer Time: 05:59). So, usually it happens with the children. And they have started designed a interesting app and an interesting app and do some reading material for child children, kids especially 2 years or two and half years of kids to understand the very basics like the fruits or excuse me and animals etcetera.

And the first when I met the startup founders of that startup, so they were saying because the design applications of Adobe are accessible we are able to make this product. So, which in fact says that we have we never thought that the products in fact can increase the innovative thoughts of the people.

So, our goal is just to make a product accessible the both the authoring part and the output, but when it is made accessible it is giving opportunity for people to use those tools to bring innovative solutions for the country. So, it is more, it is just a new business that have started for them, it is that is how the business gets impacted.

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Then the legal aspects, as we have enough discussions around the legal aspects of accessibility. In most of the countries, it is a legal requirement as India we have right to persons with Disabilities Act; in US you have American's with Disabilities Act you have Equality Act in 2000, Equality Act 2010 in United Kingdom etcetera. So, which in fact, have been drafting is the center of drafting their own guidelines to ensure the web and other digital content in their countries accessible.

So, what if any website or application in United States are not is not accessible. You can go and sue them for with the department of justice to ensure that they are providing accessible solutions. In fact, from the last 4 years we have been seeing 36 percent increase in legal suits especially in United States.

And we would have been looking at the suits like target have been sued, and majors like Amazon, Wells Fargo, American Express, Bank of America, there are so many organizations that have been sued and in the recent era we have been seeing the ecommerce websites are sued highly. So, anyone who is not able to book a product on a website, they have the liberty to go on sue them.

Student: In fact, I just got to know somebody totally get a I mean this year, they are more in 1000 cases, in fact, the number could be much more higher, but yeah in US, they were more than thousand cases on the website.

First 6 months, it is more than 7000.

Student: First 6 months, it is more than 7000 cases in 2018 for non-compliance accessibility.

And we I hope after 2019 we also have (Refer Time: 09:08) numbers.

And we need all of you guys to step forward. It is not because to sue them or make them pain, but it is more making them aware of accessibility; obviously, our first step will be educating them. And if people are not ready to listen there is only two ways to approach legally them. Yes, being said that there is an increased demand of accessibility resources, designers developers and quality engineers, because people are hiring to men to ensure that they are no more legally sued, and the penalties that happened in United States because of inaccessibility is much higher.

I remember a few years back one of the financial services have to stop their few products enhancements to pay the penalty from the budget. So, it is very much apparent that the pain one side they have to put the penalty, after paying penalty are they not is are they entitled to continue as it is, no, they still have to make their website accessible. One side the penalty and anyway they have to pay they do not have a choice to refrain themselves by not making the website accessible.

So, legally it is very much important that you have websites and products accessible, and the technical part of it; when we are talking about the technical part as Joyjeet have just mentioned in the previous session and we are talking about technical aspects. So, we may have to ensure our applications are future ready. So, if we have not thought about mobile 10 years back, we might and you have a just same website for 10 years, you might not be able to use your website on a mobile device.

So, when you make your website accessible, it is more or less having impact on the futuristic technologies. So, if you are making your website accessible, it is already responsive. If you are making your website accessible, it is meeting some access standards of search engine optimization and you are coding with the standards. So, most, most probably you will not break anything or in the flow.

So, automatically the technical standards are met, and it decreases your testing time, quality checking time because you already have made significant effort in making website accessible, no broken links, no missing of link text, no missing of alternative text, no missing of labels etcetera. So, when you are testing your application, you are already met in few of the quality checks already met because of accessibility.

So, technically you are more stronger future ready and more robust in terms of reaching out to a wider user agents like you say browsers or assistive technologies or any other devices like mobile, it may be handheld devices or maybe smart watches or maybe IoT devices etcetera. You are already making sure that our application is future ready and last, but not the least is the social impact.

As a great example Ankit is giving because of him there are four or five additional people who have shifted to work or Amazon really, yes, it is even in the case for me. So, we were using Food Panda and Swiggy for last 2 years and I think now 3 months or 4 months back Uber eats have been started in our location and that is where I got audible what do you call additional leverage to get whatever I want of course, my I do not like the food my wife prepares so.

Student: (Refer Time: 13:07).

So, I am just kidding, but yes but yes Uber has have given me a flexibility to choose what I want. So, there was after my marriage, so it was, so often that my wife says you would not love, you never give me a surprise. So, I have to just play a joke at that time that I do not really like prizes and surprises, but on the bottom of the heart I want to do it and she likes ice creams I cannot book it on Food Panda or Swiggy, but when Uber eats came into picture, I just surprised her with some something new, so which in fact, then she started using Uber eats because I surprised her.

So, it is more like we are not no more using Food Panda or Swiggy, we all have completely shifted into Uber eats because just because it is accessible. And I am sure there will be so many other people who are understanding the pain of accessibility and they are shifting on to newer or accessible applications and so as a family members or friends and so on so forth which in fact, socially is impacting accessibility, socially impacting the application.

And as we have mentioned there is a bigger picture of spending capability of a persons with disabilities and their family members which is a eight trillion is I do not think, no, bigger product company have that bigger turnover, but which is definitely a bigger market to be tapped upon, and socially financially, technically and legally also we will be in a better position if we are making your applications accessible. So, ah that what is the next slide I think we have to.

Student: We have reached the WCAG 2 framework.

Right. So, most of you have heard about this web WCAG standards when Joyjeet is talking about. So, I will just touch upon a few aspects of WCAG. I have been in the WCAG working group in the past. So, I want to just give you a outline of how these working groups work, and what are different task forces and working groups. I do not want to again go back to into this same theory what we were talking in from the morning.

So, we you already you know what are WCAG guidelines in web content accessibility guidelines that are developed by or were framed by World Wide Web consortium. So, the first time when we had this web accessibility standards in 1999. We have WCAG 2.0 sorry 1.0. At that point in time we just had the static websites, no interactions, no dynamic content, no carousel, no tabs or no models etcetera, not that model it is a web model.

So, no such a models etcetera, so that is the reason the world wide web consortiums, web accessibility initiatives, working group has framed the new set of patterns called WCAG 2.0 in 2008, it was recommended by W3C. And as you might be seeing on the slides there are four principles - perceivable, operable, understandable and robust. It is just a structural blocks of WCAG standards and each of these principles have something called standards sorry guidelines in it the guidelines in each of these four blocks there are 12 guidelines.

So, if you take perceivable, so the first guidelines talks about non-text content should have sufficient alternative text. Similarly, if you have a time based media like audio video content, you should have provided with alternative methods like you have a video, there should be a caption available. If there is a video that is just an image, just a video, no audio played, you might have to have a narration that comes along with the video. So,

these are some standard some guidelines that are under each of these principles, so 12 guidelines.

Under this 12 guidelines each of them have I mean totally there are 61 such criteria. So, whenever you are doing some web accessibility evaluation or to understand whether this application is accessible standards or not, you have to look at the success criteria, the 61 success criteria.

So, these are the testable statements, neither the principles nor the guidelines are the testable statements are those are just the building blocks of the framework. So, this 61 success criteria is again categorized into three levels level a double a and triple a. And the W3Cs working group recommends having level a compliance, sorry level double a compliance sorry recommends level double a compliance.

So, why this bifurcation is, because it is not always a feasible to meet all the requirements of accessibility, and it is more expensive, more tough and it also creates some impact on the branding of the websites or branding of the organization. And it is not feasible always because of the technical difficulties, so that is the reason they want to cut off at a some point which is reasonably accessible and usable. So, that is the reason people do not go for level triple a require level triple a standards. There are very few websites you can see which claims to be level triple a or at least they tried to do an attempt to have triple a compliance.

So, level a is simple and no much deviation on the design that happens. So, if you see any of the level a guidelines, it is more on the code level that we are making changes which might not impact a highly on the design. So, when you are making a level a compliance you say just provide an alternative text for image or you provide a technical heading standards or you might be adding one more attributes, so that it makes it is more accessible like h 1 tag or maybe some attributes of audio etcetera, so that is how level a is; so, wherein there is a minimal or no impact on the design of the application.

When it comes to level double a it will have a significant impact or maybe a better impact on the design on the UI part of the application. Say for example, one of the success criteria says that ensure that what is that yes there is a contrast ratio of 4.5 is to 1 between the text and its background. So, you have a text of blue colour and if there is a

background colour, some other background colour like a green, and you how to calculate the contrast ratio between the foreground of text and its background.

So, for this you have to make some changes say what just 2 is to 1 ratio of the contrast there are tools to do it called colour contrast analyzer. And there are some other tools where if you can just have foreground colour and the background colour, satisfy values if you give it, it will generate the ratio or is a contrast, and use the colour contrast analyzer desktop application where if you pick the foreground colour and background colour, it will display the contrast value.

If the contrast is less than 4.5 is to 1 to meet the WCAG requirements of the accessibility standards, you have to increase the contrast ratio which means the intensity of the foreground colour has to be increased or decreased or the background colour has to be increased or decreased. So, this will make a difference in the UI, there will be an impact on the user interface.

Similarly, some of the guidelines talks about you should have which visible labels on the screen. So, you have a form that says first name, last name, email address and submit button. And we have a beautiful attribute called placeholder, and people are very interested to use it. But what happens with the placeholders do you can anyone help me understand what does placeholder do in terms of creating a problem for person disability?

Student: So, and when you select the screen reader it probably says input box.

Right.

Student: And it reads the texts the ratio (Refer Time: 22:04).

Right, that is one way of saying it. Any other thoughts? Ok, so if you are going to the form and you have a placeholder text in the forms. So, if you remember how the placeholder works is, the placeholder says first name, and when you start typing it the first name disappears and you whatever you type will come over there. Is it?

Student: Yes.

So, that is how the placeholder works that that is why the place holders are there. And now you have filled the entire form, and there is no place holders meaning there are no labels and it says Rakesh, last name Paladugula, and email address and submit button. If say for example, I want to go and recheck it, it is a small form you know that this is a sequence. But if you are filling up a bigger form and you want to check whether you have filled everything right or wrong, there is no label, it is only the text that you have filled in is there.

So, how can you make the corrections, how would you understand or in other words people with cognitive difficulties who have short term memory loss. So, someone here I am filling up a form and someone called me, I went out for 10 minutes and came back and started continuing the form. And I do not know where I am, what are the fields that are filled in because the labels are already gone away with the placeholders and the text has come in that place.

So, now the guideline says that there should be labels for every form element always visible on the screen. In this case place holder is no more a good solution, or if you want to use the still use the placeholders, do something technically to say that it is always visible, even after you fill in your first name and last name, the label should still be there the placeholders should be still there. So, which is a design impact you are adding some additional content which is not available previously so that is why level double a is little tricky where you have to make some changes to the design.

And triple a is even complex because the if I take the same success criteria of colour contrast, the triple a requirement says that there should be a minimum contrast ratio of 7 is to 1 between the text and its background, 7 is to 1 is almost like a high contrast mode of black and white TV. So, people are not interested to make those changes or it impact is highly impacts the branding of the application, so which people do not want to do it.

Or some other techniques that says there should be a sign language or sign language or additional features that can allow people with hearing difficulties to use the application. So, which is very difficult at this point in time maybe if AI have more sophisticated or more intelligent ways of doing it, maybe it comes soon, but as of now it is not a good way of looking it. So, that is the reason level triple a meeting is highly difficult.

Student: Question.

Yes.

Student: WCAG does not recommend having a separate sub domain or (Refer Time: 25:18)

Absolutely not; so, it is as simple as it was the case earlier people used to have a static website just saying that it is an access of the website. There are challenges to it because the increase in expense to update. So, if you are updating a website, now you are going to update two websites, one is an accessible one another one is non accessible one that is one way of saying it.

When you look at the social way of looking at it, you are saying if you are disabled come like this, if you are not a disabled, you come like this means you are discriminating people, so that is the reason it is no more a practice that accessible website and the general website are two different things.

So, generally just to add to this, so in case your website is completely inaccessible and you know that you know you have a plan to and luckily you can correct me if I am wrong. For a temporary solution for a very short term solution ok, you can you can access some material here now for time sake, it has to be time bound for those cases it is sometimes acceptable, but at most of the times you have to make sure your product, your core application, your core website is made accessible.

From a long term point of view because we have also seen that you know your development cycles in terms of the product update, feature update, those are always left behind for the excessive emotions. So, eventually your main core application has to be done it, in case if it is completely inaccessible and you know that you want to do it only for a very short period of time you can have that as a worker on it.

Student: Ok and will it will (Refer Time: 27:01) if there is a option (Refer Time: 27:03).

So, you can fight saying that I have the option because I think there are some organizations wherein you have a job application form which is not accessible, and there is a telephone number which may or may not work, but it will be available on the website, and for accommodate accommodative solutions call us, and it is how businesses argue.

Student: Yeah, that is not my question. My question is if instead of having a separate sub domain, if in same domain same site, you just toggle an option saying accessibility, friendly or something, and you have a triple a complaint (Refer Time: 27:42) is that still is that complaint to WCAG or.

No, see WCAGs never says that you have to have a button that does this or does that, but it always talks about this existing content. There is no additional content that or additional way of looking at it.

Student: As a business why would you want to do like an existing.

Yours question is well because.

Student: (Refer Time: 28:08).

I see.

Student: From a design point of view yes.

That is one and the other thing is yes most of the Indian government websites you might have been seeing screen reader mode or high contrast mode, or if you switch that button it, it switches on two different colour schemes and all, which people think that it is a accessible solution, but not necessarily.

Student: So, (Refer Time: 28:33).

So, it is two folded.

Student: (Refer Time: 28:36) they are hard it is hard to define.

So, that there are something called authoring tool accessibility guidelines. So, there are two parts of it. One if I understand it right you are saying the programming interface need to be made accessible. And, while you are making your program there should be additional checks or additional attributes that will recommend or without which your program does not get compiled is that what you are trying to say.

Student: Yes.

Yeah, they are trying it, but again as I said if I am a business organization who want to release a editor that can create website, it is my responsibility to make ensure all those features are in built. So, W3C can just say these are the standards that you have to look at, but it is not the controlling body of those organizations, but it is again the people who have to sue or do whatever they have to do to make those applications accessible.

And if you just see the even the guidelines or the criteria, the success criteria that are mentioned those are actually recommended and it goes back to a discussion on functionality right. So, my functionality if you have a video content, so you will have to have an audit restriction or a subtitle, so that people with speech and hearing impairment or visual impairment can access it on equal basis with others.

Now, one framework in terms of an environment that you use is completely up to you at as far as you making those functionality work for me, it is ok. So, whether it is through an id or even through the tool that you making it is you know. So, WCAG definitely provides you those recommended expected areas which I need you as an application or a website owner that needs to fulfill.

So, yeah, so other thing I would probably add is there are applications which say if I take wordpress as an example, wordpress authoring site is accessible, and it also gives an opportunity for you to choose the accessible methods of doing it. Do you do or not, it is again a different story.

So, if I take my example of a wordpress, I can write a line of text I can increase the font make it bold and look like a heading, it is my choice, but wordpress authoring tool will also allow me to make it as heading on a heading level 2. So, if I use a heading level and heading level 2, it is accessible where is whereas, if I increase the font size and make it bold it is not accessible, it is again the choice of the developer.

And as you said maybe not all the authoring tools are not accessible or might not be giving same experience as wordpress does, but definitely it is a good point to be added in the feature. And the next slide probably I will be talking about is the (Refer Time: 31:34).

Student: There is no next slide.

Let me. So, do you know what are the things that come to your mind when we talk about digital accessibility, is it websites, mobile applications, anything else you might be thinking about.

Student: ATM (Refer Time: 31:51).

Absolutely that is good.

Student: Lifts.

You mean the screen on lift or the buttons on the.

Student: Both.

So, buttons, it is anyway physical it is there are two parts of it digital content is something where you have a digital screen and you are trying to touch, interactions etcetera, but physical I do not say it is not an accessibility thing, but it is an infrastructure accessibility or as simple as the dashboard of your.

Student: Dashboard consoles.

Dashboard consoles and the audio players or the video players in your car, they have touch screens. And any kiosks not only ATM or you might be seeing what you call platform ticket things machines on the railway station or boarding pass collectors on airports, digital displays on airports, and everywhere you see the accessibility standards apply to any of these, all of this. So, that is why we say WCAGs is not technology dependent, you can apply to any technology that you are using it may be document, it may be web, it may be mobile or any other digital kiosk etcetera.

It is not technology dependent especially in other words also you may be using html, css, JavaScript or ruby on rails or any other technology which in fact, creates the UI the accessibility guidelines are applied to them, so that is the reason we have the next guidelines that had just came in I think June 2018, the dot next version WCAG 2.1. So, added few more guidelines that talks about the implications of low vision users mobile users and people with cognitive difficulties and more coming soon which probably will be renaming as AG - accessibility guidelines. It is not no more WCAG.

And, AG 3.0 or if they may come into WC 2.2, 2.3 but, the larger release will be AG 3.0, which is accessibility guidelines 3.0; so, even the standards body is converting the word WCAG into Ag some people may call it as silver as you might know Ag is the chemical symbol for silver. So, people are call it silver guidelines or Ag accessibility guidelines 3.0 is going to be work is already started it may be released may be in 3 or 4 years. So, they are trying to get more understanding of low vision mobile and cognitive users, so there are (Refer Time: 34:49).

Student: IoT device.

IoT devices etcetera; so, there are task forces and working groups working and most of you are working professionals and students, I would recommend you to go back and see the working groups and how the task forces work. And, if you have time and if you are more interested to join the working groups, please feel free to join our working groups and task forces which in fact give you a more understanding and also you can contribute to the World Wide Web consortiums guidelines.

So, working groups and task forces are already formed. You can look at and any time probably join if you have a good understanding of accessibility, and you have to contribute to the web.