JOSH: Hello, and welcome everyone to today's webinar, where we'll get a peek into the way Google and Adobe think about video accessibility. My name is Josh Miller. I'm one of the founders of 3Play Media, where we offer solutions for accessibility, user engagement, and video search through a more advanced transcription and captioning process.

We're really excited to have two experts on video accessibility with us today, Andrew Kirkpatrick from Adobe and Naomi Black from Google. The collective technologies of Adobe and YouTube power the vast majority of web video today.

Andrew is a group product manager for accessibility at Adobe Systems. Andrew's team defines Adobe's overall product strategy for accessibility, and they work across Adobe's entire product line. He and his team also work with customers in several standards groups, including the US Access Board's Section 508 Advisory Committee and the W3C accessibility working groups.

Naomi is an engineering program manager for accessibility engineering at Google. Naomi works with engineering teams to help make the web and mobile devices more accessible for all. And she also works on captions for YouTube.

It's worth noting that both Naomi and Andrew serve as members of the Video Programming Accessibility Advisory Committee, known as VPAC. This is the committee that oversees all recommendations for implementing an as good or better captioning experience for television programming delivered over the web and all other streaming-based devices.

VPAC was created by the FCC after the 21st Century Communications And Video Accessibility Act of 2010 was sworn into law by President Barack Obama. This is also referred to as the CVAA and was a major milestone in establishing accessibility policies aimed at web-based content.

Some quick administrative items. The hash tag for people following along on Twitter will be video accessibility, as you see on the screen. It's spelled out as videoa11y, all one word. Please also feel free to type any questions during the webinar into your window, and we will address them at the end of the presentation.

I will also be posting a recorded version of this webinar on our website with captions and an

interactive transcript. So in case you want to revisit any of the topics discussed, it will be there for you.

So with that, we're going to get started. We have one hour for this webinar. Naomi and Andrew will give us a joint presentation where they'll discuss why captioning is a good idea, go over the CVAA, as well as some Adobe and Google-specific technology updates.

We'll then follow that with audience questions for however much time there is remaining. So we'll now pass control over to Andrew, who is going to start us off.

ANDREW: The first topic that we wanted to just spend a couple minutes on is just in response to the question, why do we need to deliver captions? And unfortunately, too often the answer is in reverse order to the order of bullets on this slide.

But really, the first reason needs to be the users that benefit from the presence of captions. There are approximately 48 million deaf and hard of hearing users in the US. And this relates probably to about 15% of your visitors, assuming equal distribution across the population.

Captions, in addition to providing essential access for deaf and hard of hearing users, also enable companies to do searching so that there's indexing of videos that is very accurate for when caption data is used because it's precise with what's being spoken.

It also benefits people who speak English as a second language. And occasionally, people may find that when they've missed *The Daily Show* at night and they want to watch it during the day, the captions that are present there, that are offered via MTV on *The Daily Show*, can be enabled. And you can quietly, without disturbing your colleagues, catch up on what you missed last night.

The final reason on this slide is the legislation. There's the CVAA, which was just mentioned. There's also Section 508, which applies to US federal government, and many education institutions, and states where closed captioning is required.

And there's other legislation, as well, that is applied. There was a recent lawsuit that was filed against a video provider in California, which was based on the Americans With Disabilities Act in California. So there are good reasons to pay attention to captioning, which should, for everyone, start with enabling access for the end users.

For the CVAA, which is one of the reasons that captioning and video accessibility is a big topic

now, the CVAA enabled the FCC to issue a new regulation for closed captioning. This was issued in early January for a new report and order. It has not yet been officially published in the Federal Register, so all the dates that are mentioned on this slide flow from the date that it finally does get put into the Federal Register, which we expect to be shortly. But we don't know exactly when that will be.

But basically, any video content that was broadcast over the television, when it is shown online without any editing, there's going to be a six-month deadline, whereupon after that date the captions will need to be present. So if it was captioned on TV, it's going to need to be captioned online or via internet delivery mechanisms for any of that video content.

If the content is edited, the deadline is going to be 12 months after the Federal Register posting. For live content, 18 months. And then archived content, which is content that's already online and doesn't have captions, there's going to be two years from that date.

So we expect that these dates are going to impact the fall programming for major broadcasters. But as I said, it all depends on when that rule actually gets published in the Federal Register.

One of the things that is not very well understood in terms of what is in the report and order is about controls for users. And there's an interesting comparison to make here between platform versus application management of this type of control.

Looking at a couple of specific examples, if we talk about viewing captions on an iPad, for example, the iPad contains a setting. If you go into the General Settings and you look at Video, there's a simple control for enabling closed captioning. And that's at the platform level. So if you're showing video via WebKit, it's going to honor that platform setting.

Contrasting that with if you have a website and it's showing closed captions, it may have closed captioned controls right on the video player. And that's something that an individual developer or a developer team needs to enable.

And there will still be this distinction after the FCC's rule is enacted. But it's something that's an important consideration for developers to keep in mind in terms of understanding what their responsibilities are, whether they just have to deliver video with a caption file and the platform takes care of it, or whether they have to do more work or integrate some additional code in order to enable that sort of access.

Some of the new types of controls that users are going to need to be able to be provided that we haven't seen traditionally online include the following items that are on the slide here. What we typically have seen with closed captioning online for many years-- because it's been possible to deliver captions for many years now-- is we typically see white captions in the bottom center of the screen. They're usually in a specific font, a simple-- often it's Ariel. And that's where the captions are.

The types of new controls that are going to be required is to be able to control the character color, the color density or opacity, the font, the font size, the various edge attributes, the background color for the caption region, as well as being able to control the language for the caption. So if they're offered in multiple languages, there's going to need to be a control to allow users to switch between them.

So this is the level of control that is far more similar to what we see in television sets today. So if you have an HD television set, and you go to the caption controls, you will find analogs to these features on your television set. So you can choose the color and the font. On TVs, you only get choices of eight fonts. Online, there's a greater possibility of providing a larger number of different fonts than that.

So it's a very different level of control than we've dealt with for captions online, where in the past it has pretty much been captions on or off. But that is definitely changing.

I want to talk about a few specific Adobe products where we're doing work around captioning. There's far more going on both in development that I can't speak about. And there's also more in-depth information about all these that's available on our website.

But just as an overview, Premiere is one of our products where we do a lot of work with closed captioning. Premiere is our video editing tool, professional video editing tool. And it has some new features, such as being able to import 608 and 708 caption data directly. And then not only importing it, but also it's showed in the editor while the video is being worked on.

There's also some additional tools supporting speech analysis and script alignment, which can help teams who are doing work with video also support closed captioning with the work that they're doing.

For Flash Professional, we've had support with Flash for several years now, about five years. Our support generally centers around TTML, which is the W3C time text markup language

caption format. This was previously known as DFXP.

And what the Flash Professional tool does is it provides components. There's an FLVPlayback playback component and an FLVPlayback captioning component. And that captioning component, when there's a parameter that's set to reference an XML file that's in the proper TTML format, that caption data is parsed and inserted as what are called ActionScript cue points. And then when the time on that cue point is reached during the video, then the captions appear.

There are a lot of different capabilities in terms of formatting and flexibility for the author to determine how those captions are displayed that is provided within that. The FLVPlayback captioning component doesn't provide the same level of functionality that the FCC is going to be requiring. So that requires some additional custom work on the part of developers in order to implement that when using that component.

Captivate is a simple tool that we have for eLearning. And this actually takes a different approach in that this tool has a built-in captioning tool that allows authors to create captions for eLearning presentations and demonstrations.

Going back to the developer side, OSMF is the Open Source Media Framework that Adobe participates and contributes to. And it has a couple of different components within it. One is for supporting TTML. But there's also a different plug-in that's available for supporting SMPTE Timed Text.

This is one that, because there's active work going on with the SMPTE committee, this is under continuous development now to improve the level of support that we provide there. But authors who want to deliver a video with captions can take their choice between these different plug-ins for TTML or SMPTE Timed Text to be able to provide support for closed captioning within players that they create with the Open Source Media Framework.

It's worth also mentioning-- it's not about captioning-- but OSMF also supports audio description via a feature that's called late-binding audio. And this, in addition to supporting audio description, also allows for there to be alternative tracks for support of different language audio for a particular video.

And we're going to do a demonstration of the open source media frameworks, some new work in there. But we're going to do that after Naomi does her demo of YouTube's player's work. So

that's the end of my quick set of slides, and I'm going to throw it over to Naomi to talk about Google's work.

NAOMI: Hello, this is Naomi Black. I work at Google on accessibility engineering. I'm an engineering program manager. And I'm just waiting to see the setting to show my screen here. So I wanted to start by talking a little bit about some of Google and YouTube's goals for closed captioning. And our big goal is we would really like every video to have closed captions.

And when you think about legislation and which areas of video that legislation applies to, that may motivate some people to add captions to their videos. But we really think that self-interest is going to be the best motivator. And so in order to achieve our goal of getting closed captions on every video that's online, we want to do a few things to help encourage people to see that this is valuable.

So the first is, we want to make captioning really easy to do. We want it to be something that you don't have to be a professional or an expert to do, but if you are working with a professional or an expert, it should be really easy for you to take those files that you have and add them to Google Videos and add them to YouTube.

So we also want to show people who are captioning their videos that there are benefits to doing this. And so one of the ways that we do this is we use the closed captions to make the videos easier to find in search. We integrate translation features. And I'll show this to you in my demo. And by translating and providing captions that can be translated, you enable your video to reach not just a small media audience that speaks the same language, but you can actually reach the entire world.

And so what we're seeing is we're seeing more and more partners online who are adding captions to their videos even though there's no requirement for them to do it necessarily in many areas, but because they recognize that, by doing this, they're going to reach a greater audience. And because the bar for adding captions has become much, much lower than it used to be.

So we also would like captions to meet consumer needs. If I'm the viewer, the audience, it's not always clear to me whether I'm watching something on the TV or the web today. I might be watching something over cable and get interrupted, and then come back later and watch that same episode from my computer.

So consumers really want the same access to their captions, the same control over their captions that they have on their TV. It shouldn't be different just because we're on a different platform.

So we're working on the underlying platforms and technologies for the web to make it as easy as possible for those captions that already exist for broadcast to just seamlessly move over to the web. So that if you're the viewer, whether you're deaf, or hard of hearing, or a second language speaker who's just helped by the captions, those captions just work everywhere. They're easy to find and turn on, and you can control whether you see them or not.

The last one that we're doing to help achieve this goal of captioning everything is we caption our own videos. So if you look at Google's official channel on YouTube, or you look at our developer channel, Google Developers, where we post technical talk about our APIs and technology, all of those videos will have captions.

And in fact, if you find a video that's owned by Google that doesn't have captions, and you want to watch it, please send me an email. My contact information is at the end of this presentation. I'm captioning@google.com. And we'll make every effort to get captions on those videos. And we do this because we think it makes those videos more useful.

So when I think about YouTube, I think about a scale that dwarfs anything that we see today on broadcast TV. You could get over 4 billion views a day, and 60 hours of video are uploaded every single minute.

We're now supporting 155 languages and dialects. Out of that set of videos, we're still only captioning a drop in the bucket. This, to me, says we have to make this even easier, and we have to really prove to video owners that there's tremendous value in adding captions.

But as of today, over 1.6 million videos on YouTube have closed captions, and 135 million videos have automatic captions. So I'm going to explain a little bit what I mean by automatic caption.

We introduced a few tools to make it easier for video owners to add captions. A few of these come from speech recognition, and they're available today in three languages. They're available in Japanese, in Korean, and in English, which is the first language we launched.

So the two automatic captioning features are automatic captions and auto-timing. And people confuse these a lot, so I'm going to explain them.

Automatic captions is where we do pure speech recognition. We run our computers. We listen to what's in the audio. And at the request of the user or the owner of the video, we try to guess what those words were.

Speech recognition is a very hard problem, and so the accuracy for this is going to be variable. It depends a lot on the quality of the audio. It depends a lot on the accent of the speaker, whether the accent is close to the accents that we used when we built the speech recognition system. Or if there is a very strong accent that may be unfamiliar to our computers.

So if you're listening to say, something that's news quality broadcast-- think of the sound of the voice of a news announcer-- that we do really well on. And when we get into noisy videos that are recorded on buses or boats or trains, or there's music in the background, it's going to be much harder.

And so we present this to the user when you turn it on. We say, look, this is an experimental feature, but we hope it's useful. And we provide it in its current state, because we recognize that there are many, many videos that are on YouTube that people want to watch that the video owners have not taken the step to caption yet. And so we provide this as an interim step to help people get some sense of what is in the video.

We also make those captions available to the video owners so that, if they want, they can download those captions, the ones that are speech recognition captions. They can correct the errors, and upload them, and make real, accurate captions that they've reviewed and approved.

The other feature that we have with speech recognition is something called auto-timing. And when we introduced this, we saw a lot of growth in the use of closed captions on YouTube. What auto-timing is is we take the text of the video.

So say you've just recorded a webinar, like this one, and you've typed out the text of everything that was said in your webinar. When you post that video to YouTube, you can also upload that text that you typed up. And this is texted very easily. Anybody who can type can create a transcript.

You upload that transcript to YouTube, and then you ask YouTube to find out where should those time codes be. So YouTube then uses speech recognition to listen to the video, try to

figure out where were those words spoken.

The words are going to be accurate because they're the words that you typed out yourself, and you knew what was in the video. When you upload them, we create the timing. And this means that for many, many people who are creating their videos on YouTube-- think about kids in their bedrooms recording a video with their webcam-- they can very easily create captions if they want to just by typing and uploading that file to YouTube.

So when we think about professionals who are creating captions-- think about somebody like the Walt Disney Studios. When they're making a movie-- like, for instance, *Cars 2*-- they have a caption file that goes with that movie when they create the DVD or when it's broadcast. And we want to be able to reuse that caption file.

So we've recently added support to YouTube for many more caption formats. We think it shouldn't matter what format your captions are in. We should just be able to handle it. So today, some of the formats that we can handle are SRT, SBV. We can handle broadcast formats like CAP and SCC and EBU-STL, and we're adding more and more.

So if you're a broadcaster, and you have a file that you've created and put that content out as a broadcast video, you can then reuse that caption file when you go put the video on YouTube, and you can meet the requirements of the law.

We also have a support for MPEG-2 Import of CEA-608 style captions. And what this means is if you had videos that are archival-- there's a lot of government videos. For instance, there's an organization called publicresource.org, and they had a mandate to take archival government videos and import them to YouTube and to other places on the web.

Many of those videos already have captions embedded in them. And so we make sure that we've preserved those captions if they're in CEA-608 format. And when you watch the video on YouTube, you'll see those captions, as well.

And finally, we have a Bulk Caption Uploader tool, which we make available so that if you're working with a caption vendor, and you send out 500 videos to be captioned and you get them back, you don't have to sit there and upload them one at a time through YouTube. You can just upload them all at one.

So if you're curious about reading more-- I'm not going into great detail about all of these-- but if you're curious about reading more, a couple weeks ago we did a blog post on the Official

YouTube blog about captions. And if you search, "YouTube blog captions," you'll find it. And it has a lot more detail in all these points.

Now I'm going to do a quick demo. And then I'm going to hand it back to Andrew. And he's going to do a demo, as well. And then we're going to move into our Q and A.

So first of all, I want to show you some of the ways in which captions make videos more useful on YouTube. So I'm going to change windows now. Now I'm on YouTube. And on YouTube, I'm going to do a search. And if I search for a phrase in a video, what YouTube will do is it will actually search through the captions of any captioned videos. And if that phrase exists in the caption, it will help me find that video.

So I'm going to search for a phrase. The last time I did a webinar, I used a phrase called "the myth of the minority user." So I'm typing that into the search bar on YouTube. And then I hit Enter to go search it. And YouTube finds all the videos it knows about that use these phrases.

And so you see right at the top of my list here, I have my first entry, which is accessibility updates for Docs, Sites, and Calendar. That's my webinar that I did a couple months ago. And you can see that at the bottom-- let me make this bigger so that you can really see this-- I can click Start Playing At Search Term.

I have a badge here that says "CC" that tells me this video is closed caption, as well. So if I click here to start playing at the search term, what this does is it jumps me right into the point in the video where I mentioned that phrase, "the myth of the minority user."

And the text that you see above here, this is the text from what I said in my captions. This didn't appear in the title. It didn't appear in the meta-data. It just happened automatically because I had captions with this video.

So I'm going to click on this just to show you. We'll see how well this works in the webinar. Now here, it's playing the video. And you can't hear the sound, because I've got it turned off to prevent feedback. So this is another reason why you might want to caption your videos, if you're going to use them in a webinar. And I'm just going to pause it.

So you can see that it has jumped straight to the part of the video where I talk about the myth of the minority user and the fact that people with disabilities actually make up a large percentage of our audience.

So here is the captions. A couple of things that you could do with captions on YouTube-- these captions are blocking the bottom part of my chart, I'd really like to see that. So I can click, and I can just drag them somewhere else. I can put them to a location that's more convenient for me on the screen. Maybe I want them down in the bottom corner here. And then they'll stay there if I play the video. The video is playing a little slowly.

I can also change the styling of these captions. So let's click the Caption Menu. I have an option of turning captions off if I don't want them. I can go into Settings, and when I click Settings, I get a bunch of choices for how to style my captions. There are some preset ones, like this is yellow on blue.

Or maybe I have a real preference for, say, green on yellow. And then I can just pick any of these colors that are provided. I can make my captions-- oh, that's really horrible. I'm going to put my captions back to the regular ones.

I can make them bigger. And this is one thing that we can do on the web very easily that's helpful for people who have vision difficulty is we can make the captions bigger. We can also make them much smaller. And we can do things like change the font, control whether there's background or no background. So I'm going to leave this.

I'm to show you quickly that we can also translate them, This uses Google Translate. So I can start with my text in English that I uploaded for my captions, and I can translate it into one of many, many languages. So I'm going to pick-- let's pick Russian. I say, OK. And I hit Play.

And now my captions for this video-- the audio is in English. My original captions are English. But now I can watch them with captions in Russian. And this won't be perfect. This uses machine translation, which is the same that you would see if you went to translate.google.com and you used translation.

But for many videos, the video is very visual. And machine translation is actually getting pretty good these days so that just having the captions and the ability to quickly translate it helps people understand your video and understand what's in it.

I'm going to show you very quickly-- If you wanted to do automatic captions, you could do Transcribe Audio here, and this does the speech recognition captions. And you click OK, and it creates them. I'm not going to bother showing you this now because I wanted to get to a couple other examples in my demo.

If you went to search-- let's go back to YouTube.com-- and you went under Movies. And let's say you searched for *Life in a Day.* So here's *Life in a Day*. I can see again through the badges here this movie has closed captions. All of these movies don't. This one does. *Inspector Gadget* does. This one doesn't.

Maybe I want to filter these so that I only see videos with closed captions. I can say Filter and just pick CC. And now all of the results that I see here are ones that have closed captions.

So I'm going to go look at the movie. This is the movie page. It gives me information about the movie, some reviews. And if I scroll down the page, I can see the number of languages that it's subtitled in. And so these are subtitles that have been professionally translated and added to the video. So any video that you look up in Movies on YouTube, you can also find out what other languages are available.

And then last, I wanted to show you a demo, actually, of those broadcast captions playing. I'm going to go here. This is a play called *8* that was recently performed in LA. It's based on the transcripts from the court. And this was staged in the theater, and the captions are using broadcast styling to position them underneath the people who are speaking.

I'm going to play just a little bit of it so you can see what that positioning looks like. If I hit Play-- and now the captions have moved to the left under the person who is speaking. And these are captions that were positioned by a caption vendor who created this caption file. And then the file was uploaded. And this helps people to understand who's speaking in the video.

And in this one, maybe you can tell because you can see people's mouths move. But if you think about something like an animated video-- something like *Cars 2*, for instance-- you really can't tell who's speaking unless you have the captions positioned next to them because cartoon characters' mouths often don't move at all, especially if they're cars.

So I just wanted to show you this quickly. This is what broadcast captions look like on YouTube. And now I'm going to go back to our presentation and hand it over to Andrew.

ANDREW: OK. So I'm just showing a quick demo which is also using the SMPTE format for the caption data. This is a quick demo that we have. It was built using the Open Source Media Framework. And what the Open Source Media Framework does is it provides a set of developer tools to make it easier to develop media players.

In this case-- so this is some custom work that was done on top of SMPTE Timed Text format support that we have checked in at the OSMF. But what this demo adds is it adds a variety of additional user controls. So it's similar to what was just shown for YouTube, but it gives you an example of some of the additional capabilities that you might find.

So in this case here-- I also did see that there was a question about being able to tab into a media player. In this case, this is a flash-based video window. There are a couple of controls that are part of that. But I can go in from the keyboard, and I can tab into these controls and interact with them to play the video, for example.

And I'm going to let it play for just a couple seconds until we get a decent caption here. All the controls that are beneath this window here, these are all just in HTML using jQuery. But in addition to simply being able to turn the captions on and off, we can also choose from-- in this case, it's just a small selection of fonts that were chosen to match the eight that are provided on broadcast television-- but we can choose different caption fonts there if it's hard to see.

There are also captions size controls. It goes way up. And you could make it as large as is practical, though you do frequently run into issues with captions overlapping the content, which is one of the reasons we also are demonstrating the capability to make the captions not cover up the video.

So if captions covering up the video is a problem, you could offer the functionality for end-users so that they could make the captions appear at the bottom, they could appear in the default position, or they could appear on top, up above the video. And what this does is it shrinks the video so that it stays proportionate and it's not distorted, but it leaves room for the captions above.

If you chose to go into a full screen, that would still be honored in that it's a full screen experience, but it's not full screen just with the video window. That would still be, of course, possible if the user had their captions positioned over the video.

There are additional caption controls that are down below here as well, in terms of being able to-- it's possible to offer end-users a full range of controls. This shows you the capacity for background. And the background color can be changed as well. So you can make the captions as perfect for you and as horrible for someone who prefers something different as you want.

There are also various possibilities in terms of outline, coloring, and being able to modify the

outlining thickness.

So this is not the polished demonstration that shows you how this is implemented around the world. And it's wonderful what YouTube has done, and we applaud that work. This is more to show you the raw capabilities that are available to people who are using the Open Source Media Framework. So that's the quick demo there for that, and then I think we're switching back to the slides.

JOSH: So please feel free to continue typing questions into your chat window. We're going to start off with a couple, but we'll continue to pull them together. So the first one to bring up for both Naomi and Andrew is HTML5 and WebVTT and how they play into this web video accessibility game.

NAOMI: So maybe I can start talking about WebVTT and HTML5. And Andrew, you can see if I've missed anything. YouTube is available today with both HTML5 browsers and ones that don't yet support it. And so we're pursuing all possible options to get videos to our viewers to make sure that they just work.

That said, HTML5 is still evolving today. And although WebVTT is being developed and added to WebKit, it's not fully implemented yet. And so as it becomes more fully implemented, we'll see more native support for it in YouTube. But today, these are still technologies that are evolving because we need all of the browsers to support them.

ANDREW: Yes, and I think that just about covers it in that there's work that is going on not only to find the support within the browsers but for the formats also. There are two or three formats that are really popular out there, WebVTT, TTML and SMPTE Timed Text. And we're really looking at what has to be done, either through JavaScript polyfills for browsers in the short term or for adding a native support into the browsers directly.

So it's a little bit of a mess, actually but there's lots of work going on, so it's improving.

NAOMI: I would say something of a familiar mess. If you think about how video works on the web today, we don't have any one video format either. And so the more popular formats, the ones that have the content that people want, tend to be the ones that browsers support.

And I think we'll see that evolving on the web, as well. Certainly on the YouTube standpoint, if you have a video and you have captions, we want to make sure that it's really easy for you to take the captions you already have and just add them to YouTube. And we don't think that the

video owner should have to become an expert in all of these different caption formats.

So our long term goal is to support-- whatever format the captions are coming to us, that should just work on YouTube.

JOSH: Great. So there's a question about internal resources. Clearly, both of these organizations, Google and Adobe, have devoted quite a bit of resources and effort around this accessibility effort. Can you both talk a little bit about how that started, and how you've been able to really fight for resources, both to tell the story as well as maybe some advice for other organizations who are trying to do the same thing?

ANDREW: Sure. I can take a quick stab at that first. I think the important piece is that you have to recognize that accessibility is a very important feature. But it's not the only feature that product teams are looking at. So it is always important to keep an eye on the business case. And that means talking to customers, talking to end-users, and figuring out exactly what the needs are. And making sure that is presented in a clear and straightforward way to help make sure that people understand the business rationale for doing this work for accessibility.

And by translation, making sure that staffing is appropriate for the task. And at Adobe, we have a number of people who are dedicated to accessibility as their full-time job. But there are also a lot of people that work on accessibility in different projects from time to time.

So one of the big pieces that has been increasingly important is making sure that we're doing education work internally to ensure that staff have knowledge of accessibility, and that it's not starting from scratch each time you have some accessibility work that needs to be done.

So really, there are significant education efforts that need to be done. And that same work also translates over to getting broader support for accessibility initiatives in general.

NAOMI: Yeah, I want to second that about the question of finding resources in any large company. To find resources, you're going to need to make a business case for it. And I think there is a very strong business case to be made for doing accessibility well.

If you're thinking about videos that are aimed at, say, enterprise users, one user at a large corporation who has an accessibility need can inform the buying decisions of that entire company. And you can wait for legislation that says, oh, you have to do this. Here's the law. Here's what's required and what's exempt. Or you can think of it as an audience question, and

think about, well, how do I meet the needs of all of my users?

And we do that-- in our case at any rate, we found that there are a lot of strong business reasons to do this. So that's important.

The other thing, I think, that I've found had been very helpful in working with engineers who need to learn about accessibility is when people don't put accessibility in, it's rarely because they hate blind users or they hate deaf users. It's because they don't know what to do. They see it as a very big problem that has no easy solution.

And many, many aspects of accessibility on the web today are quite well known. And so the more that you can educate people about what is actually needed in order to meet the needs of these users, I think the easier it is to find people who are willing to step up and do that work. It's not a great mystery what's needed to do these things.

JOSH: Great. There are a couple more questions about HTML5 actually, and mobile devices. So if we go back to that for a second, could you talk a little bit about feature parity with mobile devices, and how far or close are we to having that same really nice, accessible experience that we see on the web coming through on a tablet or phone?

NAOMI: So the feature parity level is really important to us. We look at the growth in use of mobile. And people are using their mobile devices more than their desktop sometimes. And we really want those videos with captions to just be available everywhere.

That said, the technology on the mobile devices is also still evolving. And the browsers that are available and the video players that are available on mobile devices-- there are a lot of technologies out there. And so, that's certainly something that we're working very hard on right now, to extend the support that we have across as many mobile devices as possible.

So today, for instance, if you watch a video on YouTube using an Android phone, the player on Android that knows about video also knows about YouTube captions. And so you can watch captioned videos on your Android device.

But on other devices, it's more difficult because you need to access the system level player. And it can take time to make those changes and get them out to all the phones. So we're working on it. It's a hard problem, but we're excited about solving it.

ANDREW: Yeah. And I would add to that that the different mobile platforms are handling captions

differently. And depending on how you're delivering your video, there may also be differences. So if you're delivering video on Android, and you're relying on the Flash Player for that video, you can have the exact same experience as you get via a desktop.

On iOs, it's going to be a different system, because in iOs, they have the caption controls at the platform level, and the experience is a different one. It's not an inferior one necessarily, but it's different.

So will we see a time where it's exactly the same experience irrespective of mobile devices that you're working with? I would suspect not, although we certainly would expect that we'd have the same baseline expectations for what is required to qualify as a satisfactory or even an excellent caption experience. But it may not be that it's identical.

JOSH: Great. So there are some questions about audio description. Could you talk a little bit about how that plays into some of the accessibility functionality that's being developed, and even what kind of demand you've seen compared to captions? It seems that there's a lot more obvious demand for captions right now. But are you hearing much around audio description as well?

NAOMI: I mean, from the YouTube side, I think audio description is still really emerging as a technology that people who are posting videos even know about and are trying to use. And so if you do a search on YouTube-- actually, can you pass me the screen? I can show you where you could find some audio description on YouTube if you bounce that back to me.

You can do a search on audio description or audio described on YouTube, and you can find videos that do have it. Let me show you, for instance. Let's go to YouTube. And I'm going to search for, "audio described." Let's search for *Life in a Day*, because I know that one has some.

So here we have *Life in a Day* audio described. And you can see that Audio Described is just put in the title. You don't today have any kind of badging that lets you easily find all the videos with audio description. And the numbers today are very, very small.

But a growing number of video producers are creating audio description. And more and more people are becoming aware of it. And as that momentum grows, I think we will see support for it. So today, the answer on YouTube is, upload a second video. So we did this for *Life in a Day*, and we've done this for a couple of our ad spots.

And we've even captioned, so I can show you the audio description. Maybe not everybody on here knows what audio description is. Let's go ahead. There is nothing going on here. Oh, you know what? Maybe I may not have the audio description captions on here. We often put them on. I'll have to double check later.

But the audio description is just audio in the background that's describing the visual elements of it. So today we do it on YouTube by mixing that back in, but we're also exploring ways-- for instance, through WebKit and HTML5-- that you could use a format like, say, WebVTT, to provide timed text to your browser, and let your browser [? use speech with assist ?] on your computer to play that text back to. So you could have audio description very easily without the need for a lot of video production overhead.

But today, this is still an emerging technology. You can find audio description on YouTube. It's not fully integrated as a separate audio track the way it is on your TV today.

ANDREW: Audio description, from my perspective, has not been as often requested. It is mentioned in-- it's a part of the CVAA legislation. It's not going to have the same level of mandates that there exists for closed captioning.

But at least for internet-based video, one of the biggest challenges with it right now is just the cost, in that to do audio description, you have to have someone who's skilled with writing to be able to correctly author the audio description. And then you have to record it as an audio file, and then you have to add it in and deliver it with the video.

There is some interesting work that's gone on recently. IBM and WGBH have done some work to investigate text-based audio description. And I think Google has done some investigations around this area, as well, with use of WebVTT.

So there are interesting possibilities out there that may lower the bar for cost to deliver audio description. So there are some exciting possibilities, because it's no less important for blind users than captions are for deaf users. So it's good to see additional work going on.

JOSH: Great. So especially after seeing the caption search functionality on YouTube, can either of you share any information you have about how captions affect SEO, or even the way Google indexes video outside of YouTube?

NAOMI: I guess that would be me. If your video has captions, and by captions I mean ones that you as

the video owner have uploaded, we will index those, and your video will be found more easily in search. And that's true on Google search. It's true on YouTube search.

And if you've translated your captions and uploaded captions in multiple languages, imagine somebody is searching on a phrase in French. Well, if you have French captions, and the words in that phrase appear in your captions because you've translated them, then that will help the video to be found through search.

And we're finding that just adding the captions does help people get their videos found in search much more easily than if they didn't have them.

JOSH: Great. There are actually a couple questions about Adobe products, Andrew, if you don't mind. Specifically about when captioning will be available natively in Premiere Pro and Encore. Do you have any information you're allowed to share on that?

ANDREW: Well, I responded back to try and get a little bit more information about the question because the question is, exactly what aspect of native support we're talking about? Premiere allows you to import 608 and 708 data files.

If the question is about, is Premiere going to offer a caption editing tool or a caption authoring tool within Premiere, that's something that I can't speak to. I know there are a lot of high quality caption tools that are out there. And in terms of standard broadcast workloads, captioning is something that is generally outsourced to professional firms that do the work and do it well.

If it's talking about support for display within the authoring environments of the caption data, that's available in the last release. That's available presently. So I'm not sure whether I'm hitting the mark in terms of the intent of the original question, but that's my response.

JOSH: Great. So some questions also about that customizable captioning functionality that we saw from both of you. What happens when that video gets embedded onto someone else's web page? So out of the native platform and now on another website. Is all that functionality still there?

NAOMI: So for YouTube, if you're embedding a YouTube video in a website, that caption menu will be available, and you can change it, work with it to the extent that-- I think the limitation is the window in which you dropped the image has to be big enough that we can actually get a menu in there. So you may need to ask your webmaster to play around to make sure that it's at least

big enough that you can get to the menu.

But yes, all those things work with an embed.

JOSH: And Andrew, is there multi-language caption support for the OSMF repository?

ANDREW: The support is language agnostic in that there's nothing that undermines your ability to deliver captions in multiple languages. With the OSMF player, you'd need to build in a player control that would allow the user to switch between the different caption tracks. So in that regard, yes, it is certainly something that it's capable of.

But the developer toolkit does not provide you anything that you would just pop in place and it supports n number of languages automatically.

JOSH: So we are actually out of time, it looks like. Thanks everyone for your questions. Thank you, Andrew and Naomi, for spending time with us and presenting on accessibility and answering all these questions.

As we mentioned, we will be posting this on our website. We hope to have it up tomorrow. Certainly feel free to check back, and you will be getting an email when that presentation is up with captions.

So again, please feel free to reach out. Our contact info is here up on the slide. And Naomi and Andrew were nice enough to provide their contact information. So thanks, everyone, for joining us.

NAOMI: Thank you.

ANDREW: Thank you.