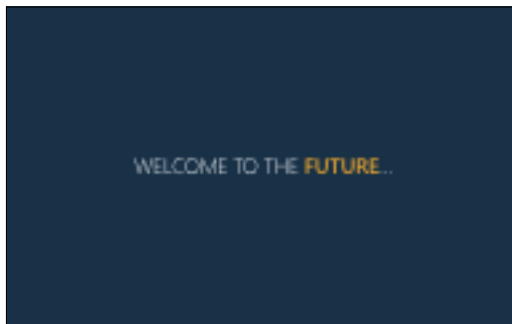
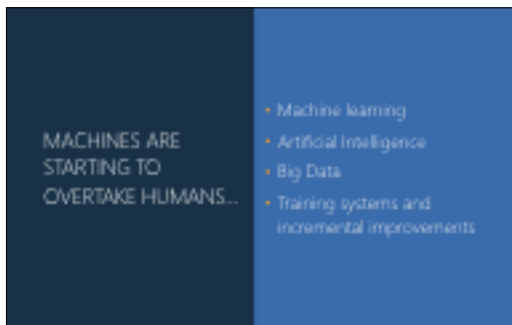




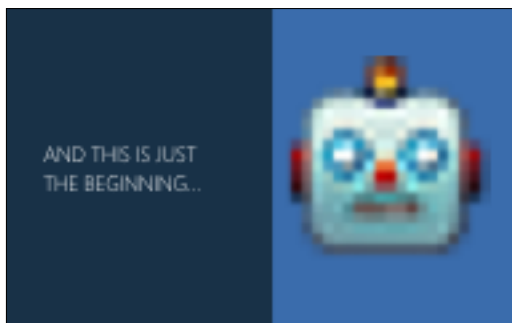
1 Today I want to give a quick view into the future and how computers aid accessibility. I also want to leave you with a few tools to make your current life as developers and maintainers of web content easier...



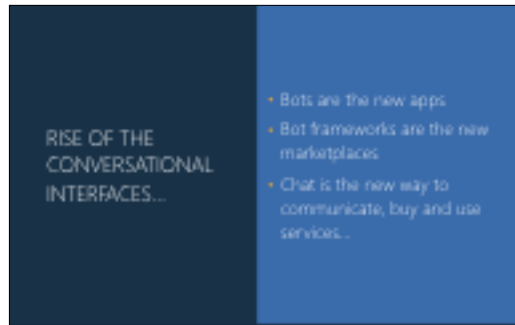
2 First of all, let's take a look at a video of what seems to be science fiction, but is already real.



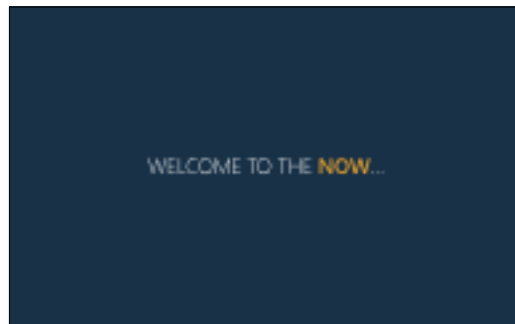
3



4 Atomisation and bots are on the rise and will be very soon a normal part of our lives.



5



6

I want to show you the technologies this future is based on.



7

I just got back from the build conference in the US and some of the projects shown were incredible. Tele2, a local mobile provider worked with Microsoft to allow for live audio translation. You speak in your phone in your language, and the person on the other side hears you in another language you chose. Tele2 are using this service to help refugees find a way to integrate in European countries.

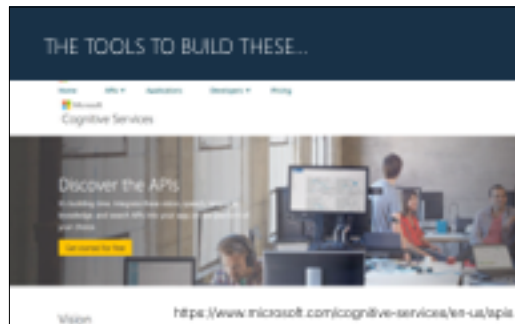


8

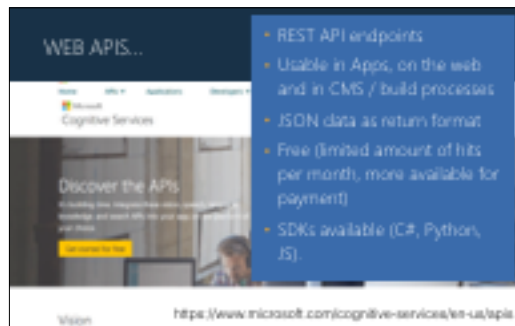
A Brazilian company called pro deaf showcased a system that translates text or live audio into sign language using 3D avatars.



9 The live demo showed that the presenter can speak Brazilian Portuguese into a microphone and the avatar signs in ASL. Quite a few different languages are supported. However, the nuances our translators here add to the translation are lost to a 3D model. Thanks to all of them for their hard work.



10 All of these demos use the Microsoft Cognitive Services. There are many other players in this market, and I want you to keep your eyes open. Today, however, I just want to show you some of these, as I know their availability.



11

- REST API endpoints
- Usable in Apps, on the web and in CMS / build processes
- JSON data as return format
- Free (limited amount of hits per month, more available for payment)
- SDKs available (C#, Python, JS)



12

Out of the box, we offer SDKs for Python and C#, but there is also a node package using these APIs. Project Oxford used to be the code name before release.

```
var oxford = require('project-oxford'),
    client = new oxford.Client('7f9873a729b72663y5ddh329e32e398d');

client.face.detect({
  path: './folder/myface.jpg',
  analyzeAge: true,
  analyzeGender: true
}).then(function (response) {
  console.log('The age is: ' + response[0].attributes.age);
  console.log('The gender is: ' + response[0].attributes.gender);
});

client.image.analyzeImage({
  path: './myface.jpg',
}).then(function (response) {
  console.log(response);
});
```

<https://github.com/felixxuberg/project-oxford>

13 Using the node package works like this. You get the results as JSON objects, and do a simple XHR call to the REST end point of the API.



14 First up are the vision APIs



15 The image analysis API gives you general information about the image. You can see in this demo that it found people swimming, that it is not adult content and that there is a 28 year old man in it. The lady in the bikini example is also not adult content, but racy. This API really helps you to categorise images.



16 For example the face detection API finds faces and their position in a photo. Each detected face gets a unique ID, so you can use this to automatically tag photos with people's names. This is also used in Microsoft Hello to allow to unlock your computer with your face.



17 The emotion API doesn't only give you the faces, but also their mood: anger, disgust, fear, happiness and the like. This is great to get automatic responses from users to videos and also to find out how your products are conceived. The positive upside is that people working with it smile a lot more, just to test it out. It would be fun to try and give it a hard-core test, of example by trying it in Finland.



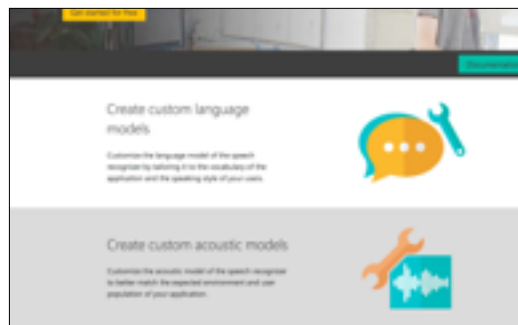
18 The language APIs allow you to do simple tests like spell checking and finding the language and the sentiment of a text file.



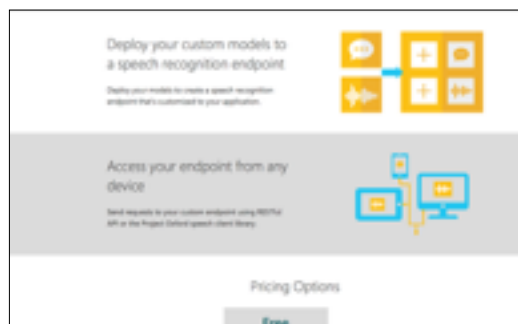
19 The speech APIs allow you to detect and find a speaker across various audio files and to convert speech to text and back.



20 The Custom Recognition Intelligent service allows you to train a computer to understand humans better.



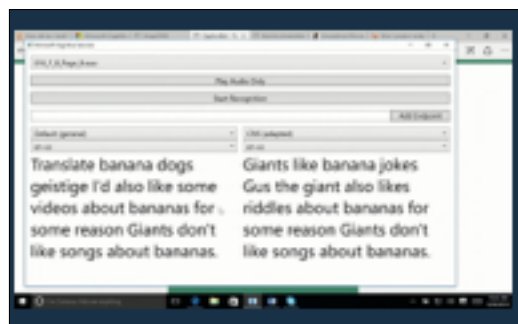
21 You create a language model and an acoustic model.



22 And you deploy these to a speech recognition endpoint and access it from any device.



23



24 The CRIS system allows to make a computer learn about the differences of pronunciation of a certain voice. In this case we asked children to talk about a book they read. On the right is the result of a traditional voice to text conversion. On the left is the one the system created after we taught it about the way the child spoke using several minutes of audio.



25 Another demo built on the APIs in the cognitive suite is the caption bot at captionbot.ai



26 Using this, you can pick any image and it will use a few of the APIs to tell you what is going on in the image.



27 In this case, it found that there is a young man jumping in the air on a skateboard



28 Facebook is using a similar technique to add automated captioning to images in their app on iOS. You can see an overlay saying “image may contain” and the information. You also get an icon to read the captions out to you.



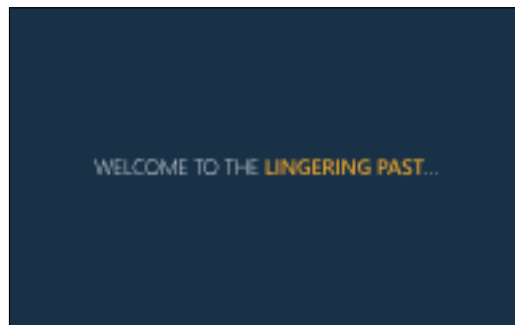
29

Twitter went a slightly different way and offers an interface to do the same. However, talking to them I found out that there is also an automated fallback in the works.



30

Let's move on from machines to people though. Incidentally, have you seen these Boston Dynamics videos with the self-walking robots and people kicking them? Haven't they seen ANY sci-fi movie? They don't forget. They will remember being kicked. And that's how the whole terminator thing starts.



31



32



33

You can download and read a long research paper with examples and exercises to do in your company at this address. It explains in detail how availability and inclusion will make your product better and that disability is not a fixed state but we all will be impaired sooner or later.



34



35



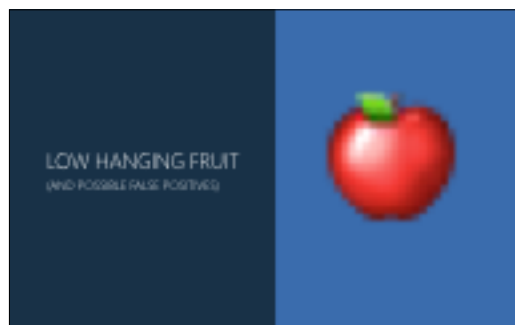
36



37



38



39

A lot of accessibility mistakes we make are simple to detect.



40

Our texts can be too complex without us realising it. Hemingwayapp is a great and free resources that tells you how to write more concise, clearer and simpler. It tells you how readable your text is and how to make it simpler.



41 Alex.js is a tool to analyse your texts and tell you when you are being inappropriate, sexist, ableist, racist or ageist and gives you alternatives. It can run as a standalone web site or as a node service.



42 Using JavaScript, we can add this functionality to Office, and it is now available in all of its programs as an add-in.



43 The aXe accessibility engine by deque is a tool to test web sites for obvious accessibility issues in your markup.



44 It is open source and can be extended and used in various JavaScript environments and to automate testing over thousands of sites.



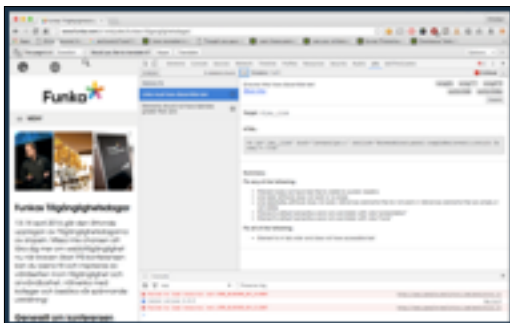
45 You can easily contribute to its rules on GitHub



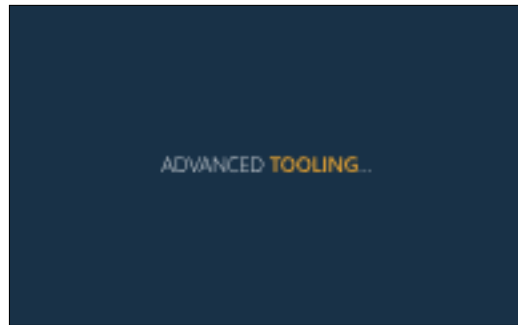
46 Using aXe could be part of your site creation process as an automatic service.



47 It is also available as a browser extension for Chrome, Firefox and Edge.



48 For example, even this event's web sites has some issues.



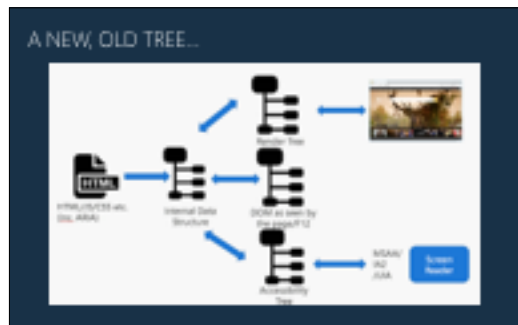
49



50

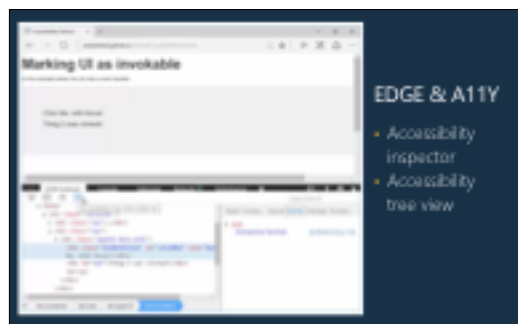
Here we have the forthcoming redesign of [HTML5accessibility.com](https://html5accessibility.com) and if I inspect the section containing the test results, I can see information about that section element.

On the right hand side, you'll notice an inspector tab dedicated to accessibility information



51

Browsers create the accessibility tree that talks to assistive technology. Until now, this tree has always been inaccessible to web developers – we just didn't know how to see what a screen reader sees.



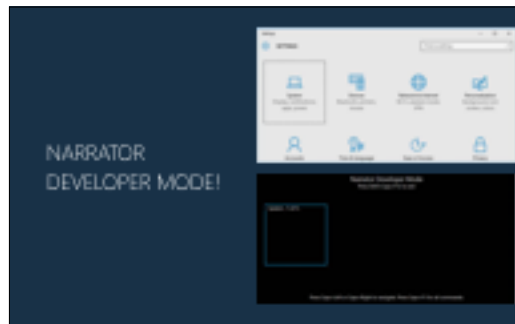
52

Now have an accessibility tree viewer which shows the content tree for accessible content created by the browser. It also shows how adding an ARIA role and a tab index turns a link into an accessible button.



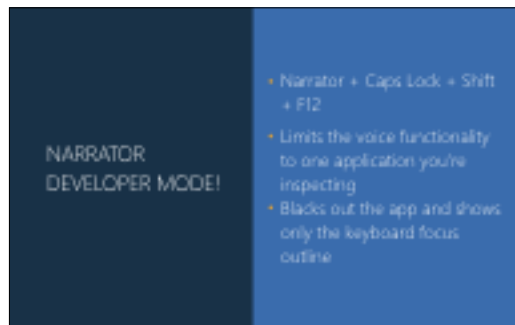
53

Using screen readers as a sighted developer was never fun. Instead of getting the information we need about the site we debug, we got all that happens on the screen read out to us. Many developers also make the mistake of having the screen on and listening to the results.

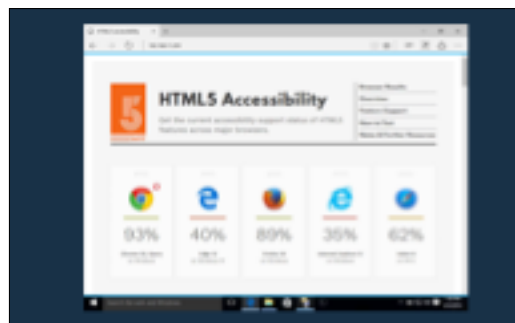


54

The Narrator developer mode makes this much easier.



55



56

Here we see the HTML5accessibility site again. If I flip on Developer Mode in Narrator, the Edge browser window goes black and I can see where the focus carat moves (the blue box), but I can't see the design. For diagnostic purposes, the contents being read by Narrator are also presented as text on the screen in the position of the element (which can help with identifying where the issue was when you come back out of Developer Mode).



57

I hope you saw that we have a lot of exciting tools at our disposal now and that we have no excuse to create inaccessible content any longer. Simply remember that the human is who you build for, not a law or a checklist. And we all keep changing and having different needs. The easier your content is to consume, the more people will benefit.



58

And with that I want to end with an app a friend of mine created to help himself.
{watch video for transcription}



59