Montacchiello Developers

Apericoder
16 maggio, ore 18:30

Web components

THE FUTURE HAS COME

Andrea Chiarelli

About me

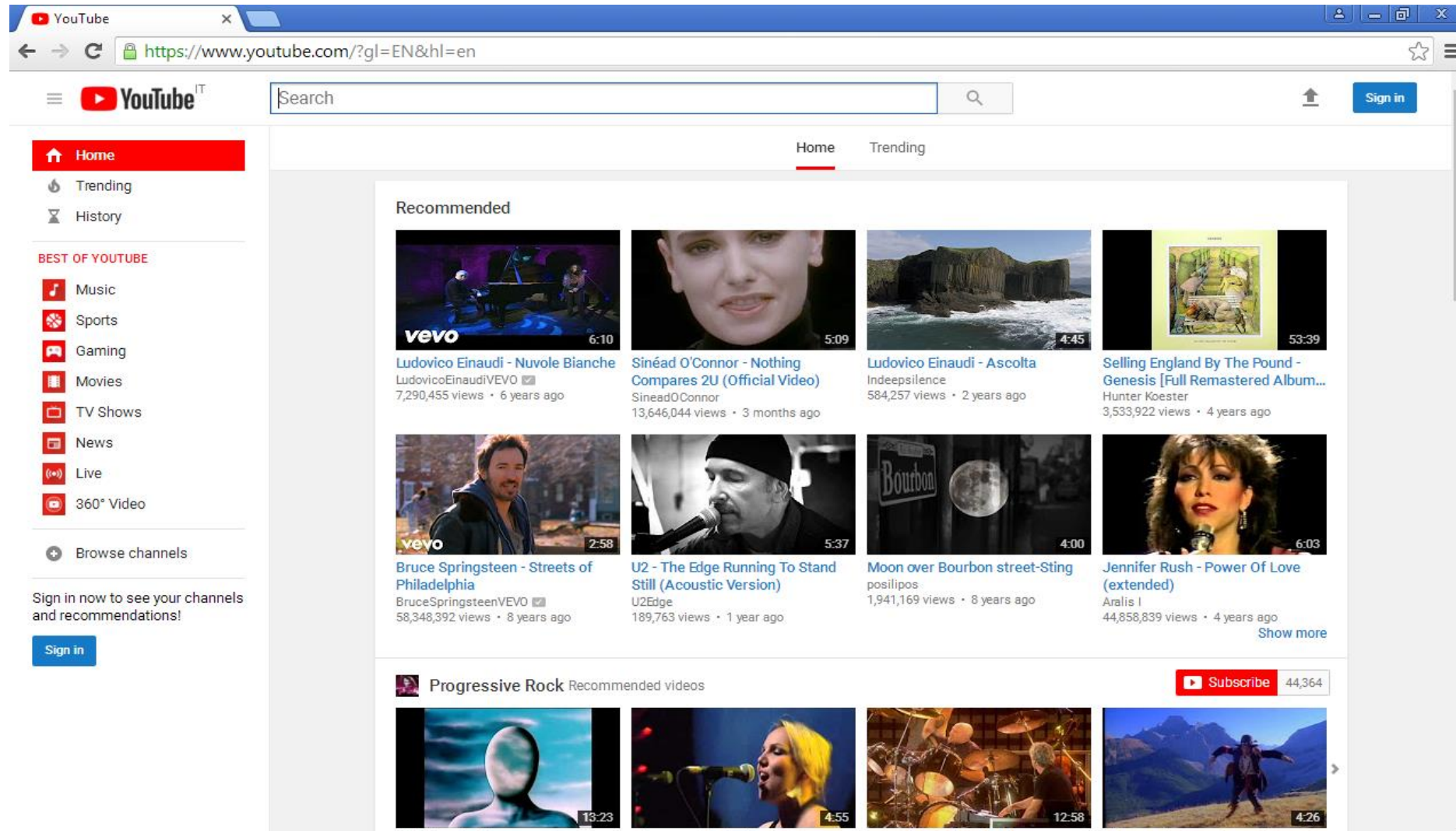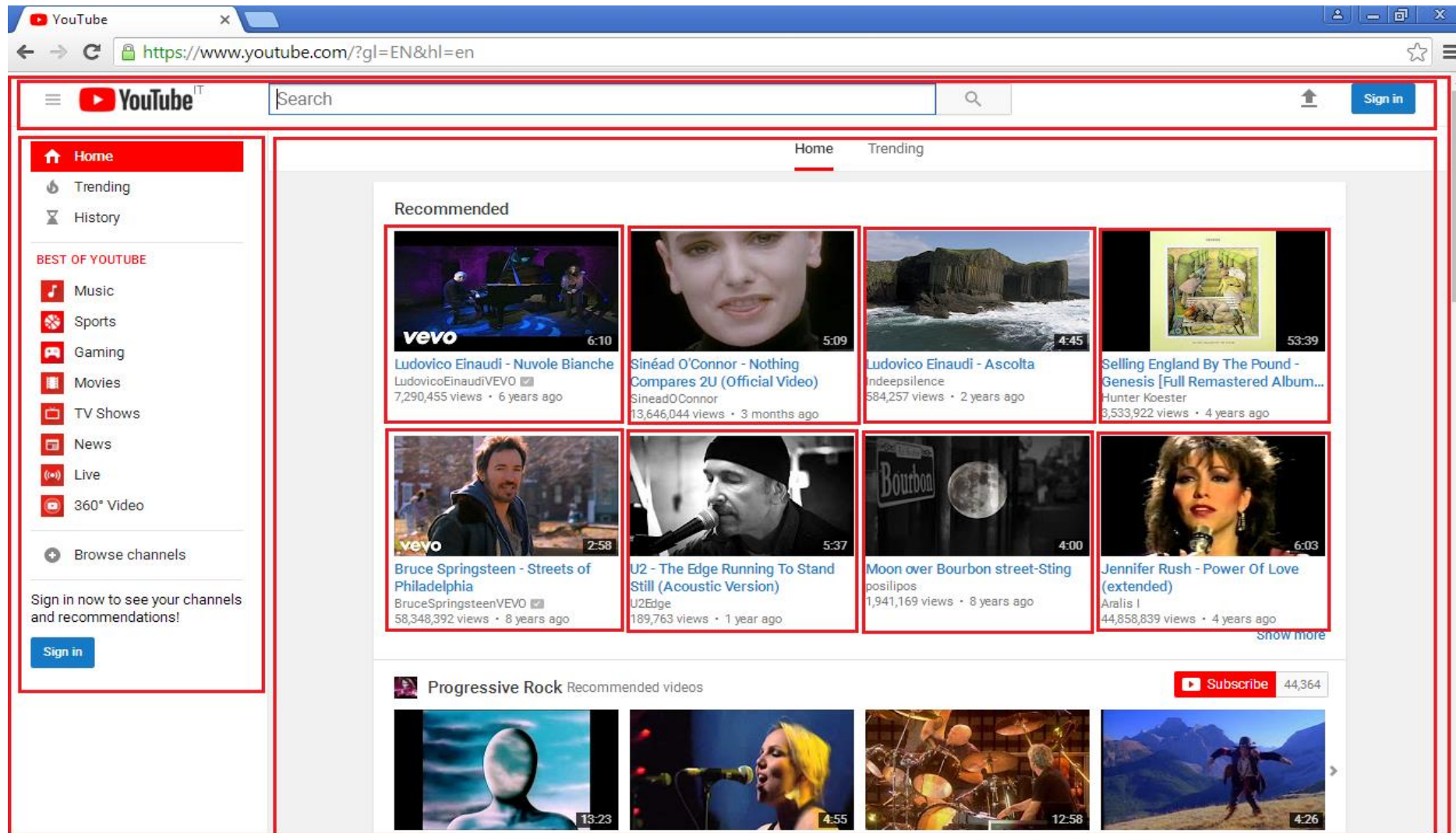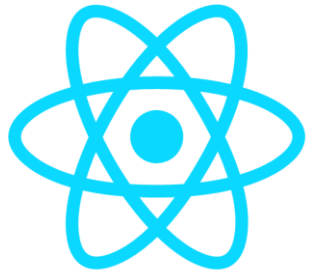Andrea Chiarelli
Web Developer and Author

APPAROUND

HTML.it   [PACKT] PUBLISHING   Auth0

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Decompose a User Interface

Decompose a User Interface

UI libraries and frameworks

Challenge

A UI component t

...is efficient and r

...works in any We   rdless the UI
framework you us

...works with no d   n third party library

...works in any rec

Web components

W3C Standard Technology

- ❑ Custom elements

- ❑ HTML templates

- ❑ Shadow DOM

Using a Web component

Using a Web component

```html
<!DOCTYPE html>
<html>
  <head>
    <title>Using a Web component</title>
    <script src="myRating.js"></script>
  </head>
  <body>
    <my-rating id="myRatingComponent" max-value="6" value="3"></my-rating>
  </body>
</html>
```

Using a Web component

★★★☆☆

Managing with JavaScript

```html
<!DOCTYPE html>
<html>
  <head>
    <title>Using a Web component</title>
    <script src="myRating.js"></script>
    <script>
      window.onload = function() {
        const myRating = document.getElementById("myRatingComponent");

        myRating.addEventListener("click", ()=> {
          alert("Thanks for your feedback!");});
      };
    </script>
  </head>
  <body>
    <my-rating id="myRatingComponent" max-value="6" value="3"></my-rating>
  </body>
</html>
```

Creating custom elements

Web component at work

A cookie alert Web Component

This website uses cookies to ensure you get the best experience   Got it!

A basic custom element

```javascript
class CookieAlert extends HTMLElement {
  constructor() {
      super();
  }

  connectedCallback() {
    this.innerText = "Here I am!";
  }
}

customElements.define("cookie-alert", CookieAlert);
```

Custom element reactions

- ❑ connectedCallback()

- ❑ disconnectedCallback()

- ❑ attributeChangedCallback()

- ❑ adoptedCallback()

Adding markup and style

```javascript
const template = document.createElement('template');

template.innerHTML = `
<style>
  .container { ... }
  .footer { ...  }
</style>

<div class="container footer">
  <span>Here I am!</span>
</div>`;

class CookieAlert extends HTMLElement {
  constructor() {
      super();
  }
  connectedCallback() {
    this.appendChild(template.content.cloneNode(true));
  }
}

customElements.define("cookie-alert", CookieAlert);
```

Properties

```
class CookieAlert extends HTMLElement {
  constructor() {
      super();

      this._message = "This website uses cookies to ensure you get the best experience";
  }

  get message() {
    return this._message;
  }

  set message(value) {
    this._message = value;
    this.updateMessage();
  }

  connectedCallback() {
    this.appendChild(template.content.cloneNode(true));
    this.updateMessage();
  }

  updateMessage() {
    this.querySelector("span").innerHTML = this._message;
  }
}
```

Handling attributes

```javascript
set message(value) {
  this._message = value;
  this.setAttribute("message", value);
  this.updateMessage();
}

static get observedAttributes() {
  return ["message"];
}

attributeChangedCallback(name, oldValue, newValue) {
  if (oldValue !== newValue) {
    if (name === "message") {
      this._message = newValue;
      this.updateMessage();
    }
  }
}
```

Handling events

```html
<div class="container footer">
  <span></span>
  <button class="button">Got it!</button>
</div>
```

Handling events

```javascript
connectedCallback() {
  this.appendChild(template.content.cloneNode(true));
  const cookiesAccepted = getCookie("cookiesAccepted")
  if (cookiesAccepted === "y") {
    this.style.visibility = "hidden";
  } else {
    this.querySelector("button")
      .addEventListener("click", ()=>{
        this.style.visibility = "hidden";
        setCookie("cookiesAccepted", "y", 365);
      });
    this.updateMessage();
  }
}
```

No encapsulation? No component

This website uses cookies to ensure you get the best experience | Got it!

The shadow DOM

The shadow DOM
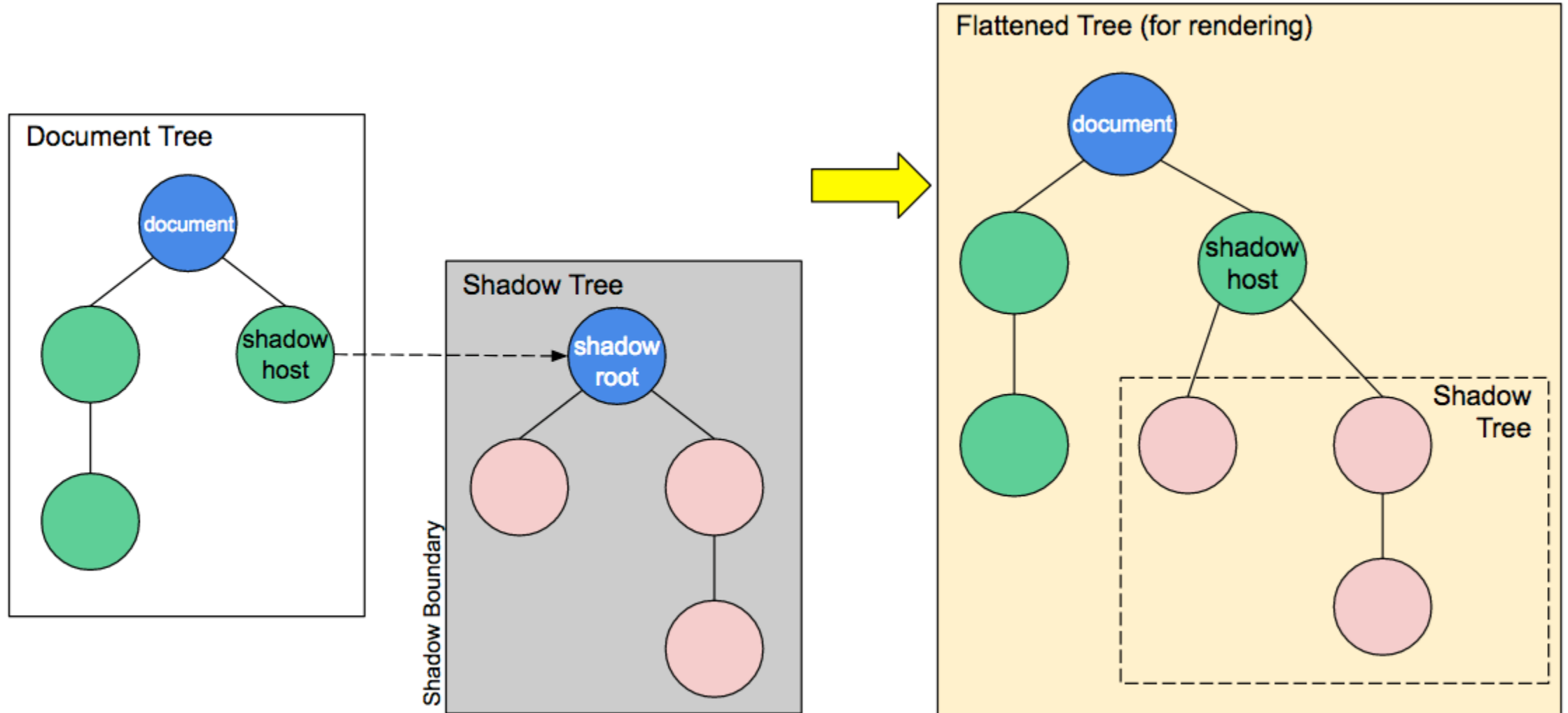
The shadow DOM

```
constructor() {
    super();

    this._message = "This website uses cookies to ensure you get the best experience";
    this.attachShadow({mode: "open"});
    this.shadowRoot.appendChild(template.content.cloneNode(true));
}
```
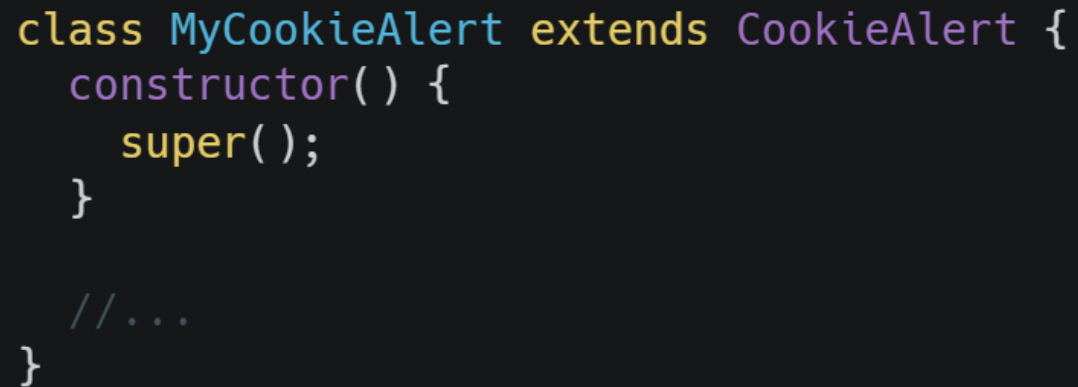
The shadow DOM

```
updateMessage() {
    this.shadowRoot.querySelector("span").innerHTML = this._message;
}
```

Extending the Web components

Extending existing Web components

```
class MyCookieAlert extends CookieAlert {
    constructor() {
        super();
    }

    //...
}
```

Extending native HTML elements

```javascript
class SecureLink extends HTMLAnchorElement {
  connectedCallback() {
    this.addEventListener("click", (e) => {
      if (!this.href.startsWith("https")) {
        if (!confirm("Stai per navigare verso un sito non sicuro. Vuoi continuare?")) {
          e.preventDefault();
        }
      }
    })
  }
}
customElements.define("secure-link", SecureLink, {extends: "a"});
```

Web components everywhere

Using in React applications

```jsx
import React, {Component} from 'react';
import logo from './logo.svg';
import './App.css';

class App extends Component {
    render() {
        return (
            < div className = "App" >
                < header className = "App-header" >
                    < img src = {logo} className = "App-logo" alt = "logo" / >
                    < h1 className = "App-title" > Welcome to React < /h1>
                < /header>
                <cookie-alert></cookie-alert>
            < /div>);
    }
}
export default App;
```

Using in Angular applications

```typescript
import { BrowserModule } from '@angular/platform-browser';
import {
  NgModule,
  CUSTOM_ELEMENTS_SCHEMA
} from '@angular/core';
import { AppComponent } from './app.component';
@NgModule({
    declarations: [AppComponent],
    imports: [BrowserModule],
    providers: [],
    bootstrap: [AppComponent],
    schemas: [CUSTOM_ELEMENTS_SCHEMA]
})
export class AppModule {}
```

Browsers support

Browsers compatibility

Custom Elements

IE	Edge	Firefox	Chrome	Safari	Opera	iOS Safari	Opera Mini	Android Browser	Blackberry Browser	Opera Mobile	Chrome for Android	Firefox for Android	IE Mobile	UC Browser for Android	Samsung Internet
		2-49													
		50-58	4-53												4
		59-62	54-66	3.1-10	10-40	3.2-10.2									5.4
6-10	12-17	63-65	67-72	10.1-12	41-57	10.3-11.4		2.1-4.4.4	7	12-12.1			10		6.2
11	18	66	73	12.1	58	12.1	all	67	10	46	71	64	11	11.8	8.2
		67-68	74-76	TP		12.2									

HTML templates

IE	Edge	Firefox	Chrome	Safari	Opera	iOS Safari	Opera Mini	Android Browser	Blackberry Browser	Opera Mobile	Chrome for Android	Firefox for Android	IE Mobile	UC Browser for Android	Samsung Internet
				3.1-6											
				6.1											
	12		4-25	7	10-12.1	3.2-7.1									
	13-14	2-21	26-34	7.1-8	15-21	8-8.4		2.1-4.3							
6-10	15-17	22-65	35-72	9-12	22-57	9-11.4		4.4-4.4.4	7	12-12.1			10		4-7
11	18	66	73	12.1	58	12.1	all	67	10	46	71	64	11	11.8	8.2
		67-68	74-76	TP		12.2									

Shadow DOM

IE	Edge	Firefox	Chrome	Safari	Opera	iOS Safari	Opera Mini	Android Browser	Blackberry Browser	Opera Mobile	Chrome for Android	Firefox for Android	IE Mobile	UC Browser for Android	Samsung Internet
		2-57													
		58													4
		59-62	4-52	3.1-9.1	10-39	3.2-9.3									5.4
6-10	12-17	63-65	53-72	10-12	40-57	10-11.4		2.1-4.4.4	7	12-12.1			10		6.2
11	18	66	73	12.1	58	12.1	all	67	10	46	71	64	11	11.8	8.2
		67-68	74-76	TP		12.2									

https://caniuse.com

Web component polyfills

```
<head>
    <meta charset="utf-8">
    <title>Cookie alert</title>
    <script src="https://unpkg.com/@webcomponents/webcomponentsjs@2.0.0/webcomponents-loader.js"></script>
    <script src="cookieAlert.js"></script>
</head>
```

https://github.com/WebComponents/webcomponentsjs

References

Cookie alert example

https://github.com/andychiare/simple-cookie-alert-component

https://www.webcomponents.org/

https://developer.mozilla.org/en-US/docs/Web/Web_Components

https://www.html.it/guide/guida-ai-web-components

Question time

https://twitter.com/andychiare