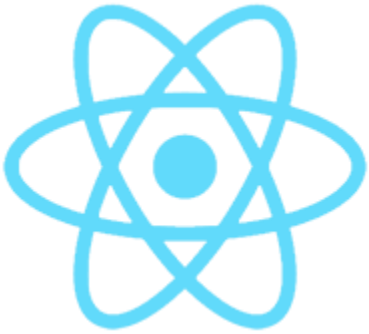


React

Contents

History of React

1. 2011 Created by Facebook
2. 2012 Used by Instagram
3. 2013 open sourced
4. 2014 Embraced by many large companies
5. 2015 React Native released
6. 2016 React 15 released (previous version was 0.14)

Today: Over 30K components at Facebook full time dev staff Used by many in fortune 500

Why React?

1) Flexibility

React is a library not a framework unlike Angular and Ember

Where can I use react?

- web apps/ static sites
- Mobile -React Native
- Desktop (can use electron to installable desktop app)
- Server Rendering using Next.js
- React for Virtual Reality websites and 360 experiences with React VR

- So Learn React Once and we can write Applications everywhere!!
- A low risk way to migrate to React by adding one component at a time-we can start with small portions
- Continue to run on all the browsers - Facebook cannot afford to run only on few browsers

Different React renders

1) react-dom for web apps
2) react-native to write native friendly code.
3) react-vr

2) Developer experience

Offers a simple API -few concepts to master

3) Corporate Investment

Facebook committed to react.

4) Community

Huge active Community Companies using react:

a) Apple b) microsoft c) Amazon twitter d) dropbox e) paypal f) slack g) netflix h) Tesla

Overview of the eco system

1. React Router
2. Redux
3. Mobx
4. Jest
5. GraphQL
6. Next.js

It is a big DEAL! 70,000 stars on GitHub 1,100 + contributors Millions of downloads/month

5) Performance

Updating the DOM is expensive! Without virtual DOM Blindly update DOM using new state with Virtual DOM Update the DOM in the most efficient way

```
React size ~35K
```

6) Testability

a. Little to no configuration required
b. Run in memory via Node so, no browser required
c. Fast
d. reliable deterministic unit tests
e. write quickly update easily

Components are pure functions making testing easy (Reliable, Deterministic, no side effects) For React the most popular testing framework is JEST (create-react-app boilerplate)

7 Key Trade Offs

1) Framework vs library

	React	Angular
Components	✓	✓
Testing	Jest, Mocha	✓
HTTP library	Fetch, Axios	✓
Routing	React Router	✓
I18n	react-intl	✓
Animation	react-motion	✓
Form validation	react-forms	✓
CLI	create-react-app	angular-cli

2) Concise vs Explicit

Two-way binding

Less coding

Automatic

```
let user = 'Cory';

<input
  type="text"
  value={user}
/>
```

One-way binding

More control

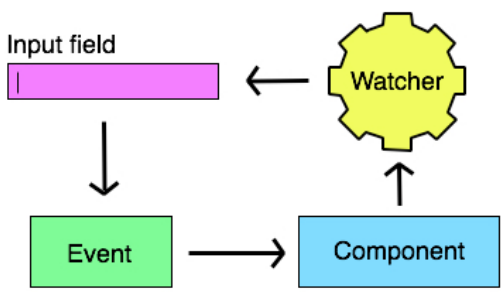
More explicit

Easy to debug

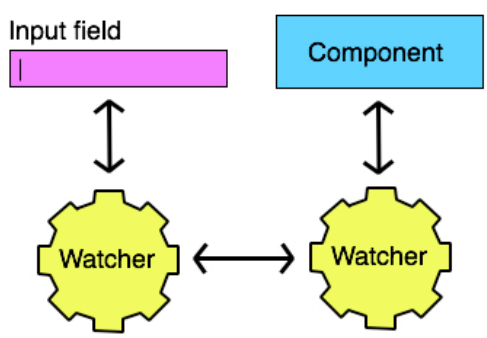
```
state = { user: 'Cory' };

function handleChange(event) {
  this.setState({
    user: event.target.value
  });
}

<input
  type="text"
  value={this.state.user}
  onChange={this.handleChange}
/>
```



One Way



Two Way

3) Template Centric vs Javascript Centric

React Js is Javascript Centric but other frameworks have their own unique syntax:

- *Modules*
- *Let and Const*
- *Enhanced object literals*
- *Default Parameters*
- *Template Strings*
- *Classes*
- *Arrow Functions*
- *Promises*
- *Destructuring*
- *Spread Operator*

Template-centric	JavaScript-centric
Little JS knowledge required	Little framework-specific syntax
Avoid confusion with JS binding	Fewer concepts to learn. It's JS.
Rule of least power	Less code
	Easy to read
	Encourages improving JS skills

```
<button (click)="delete()">Delete</button>
```

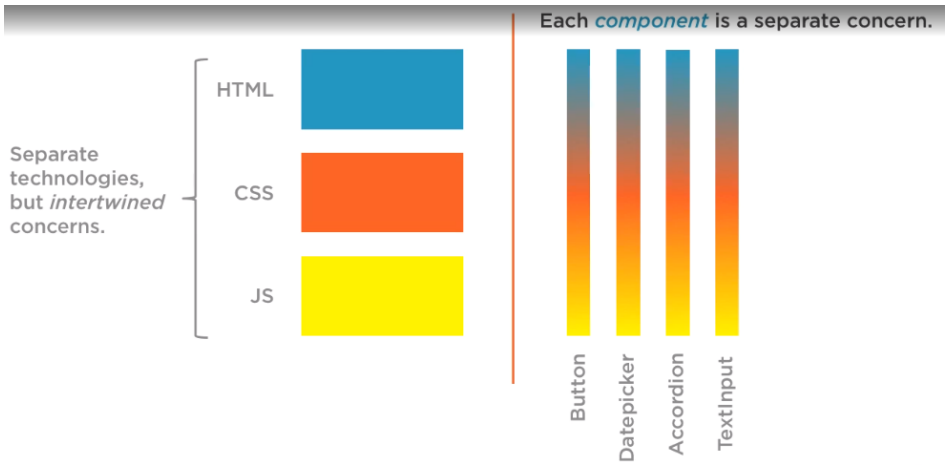
```
<button v-on:click="delete">Delete</button>
```

```
<button onclick={{action 'delete'}}>Delete</button>
```

```
<button onClick={delete}>Delete</button>
```

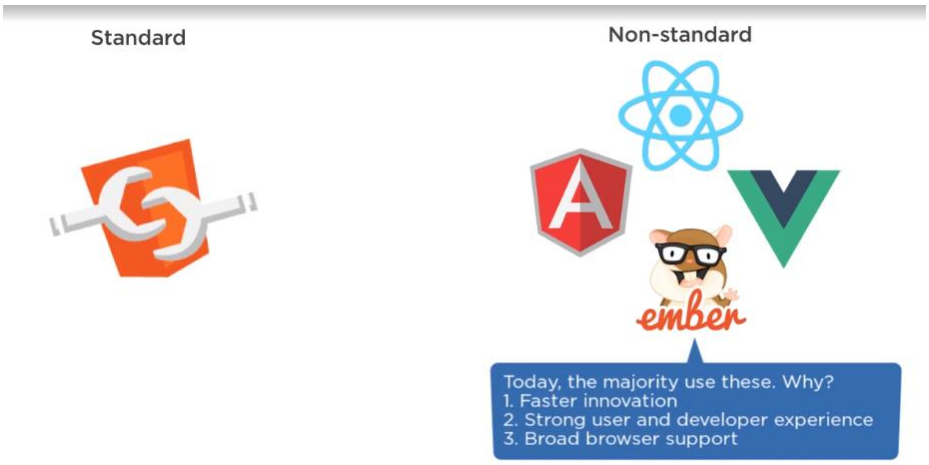
4) Seperate Template vs Single File

Components can be composed eg: Navigation, Book List, Book Description etc.



5) Standard vs non Standard

React is one of many non-standard component libraries



6) Community vs Corporate Backing

React is driven by Facebooks needs, although other libraries are community driven but other than that, has:

1. Full time development staff
2. Over 1000 contributors

3. FB: World's 5th most valuable company
4. 30 K components in production

So With React We are,

Getting… Explicit/ Javascript centric /Single file component/ Non Standard /Corporate Backed /Library ***and Giving up…***concise /Template centric/Seperate template/standard/Community based framework

4] Potential Issues with React

1) JSX and HTML Difference

Options to Convert HTML to JSX

1. find/replace
2. Online Compiler
3. htmltoJSX on npm for large files

HTML	JSX
for	htmlFor
class	className
<style color="blue">	<style={{color: 'blue'}}>
<!-- Comment -->	{*/ Comment /*}

2) Build Step required

As we need to compile down JSX to JS but no matter what JS framework we use for web apps a build step is critical

1. minify the code to save band width
2. Transpile the code so that we can use modern JS features
3. Lint our code and run automated tests

What are 2 transpilers Compile JSX?

1. Babel
2. TypeScript

There is a variety of React -boiler-plates to get started and to have build steps built in - automatically-to transpile JSX for us ,create-react-app is the most popular option.

3) Version Conflicts

- In React JS there is a runtime and we cannot have 2 versions of react on the same page
- We will be using other libraries like react-router with react (eg: React router needs React 15+)
- FB is consistent about releasing codemods when breaking releases occur - upgrades to existing react components can be easily automated

How to Avoid Conflicts:?

- Standardize on a version
- Upgrade React when upgrading libraries
- Upgrade as a team

4) Old stuff on Searches (outdated Resources)

Old	New
`import {render} from 'react';`	`import {render} from 'react-dom';`
`React.createClass`	`var crc = require('create-react-class');`
`import {PropTypes} from 'react';`	`import PropTypes from 'prop-types';`
`mixins: [mixinNameHere]`	Higher order components, render props

5) Decision Fatigue

1) Dev environment

We can visit andrewhfarmer.com/starter-project to select one of the dev environment
create-react-app boiler plate-popular
React-router

2) ES class or Create Class

createClass

```
var createReactClass = require('create-react-class');

var Greeting = createReactClass({
  render: function() {
    return <h1>Hello</h1>;
  }
});
```

ES Class

```
import React from 'react';

class Greeting extends React.Component {
  render() {
    return <h1>Hello</h1>;
  }
}
```

3) Types

Prop types

```
import React from "react";
import PropTypes from 'prop-types';

function Greeting(props) {
  return (
    <h1>Hello {props.name}</h1>
  )
}

Greeting.propTypes = {
  name: PropTypes.string
};
```

Type checked at runtime

Type Script

```
import * as React from "react";

interface Props {
  name: string
}

function Greeting(props : Props) {
  return (
    <h1>Hello {props.name}</h1>
  )
}
```

Type checked at compile

Flow - A different way-we add annotations

4) State (App's data)

Plain React

Flux

Redux (most popular)-centralized state

Mobx (observable state)

5) Styling