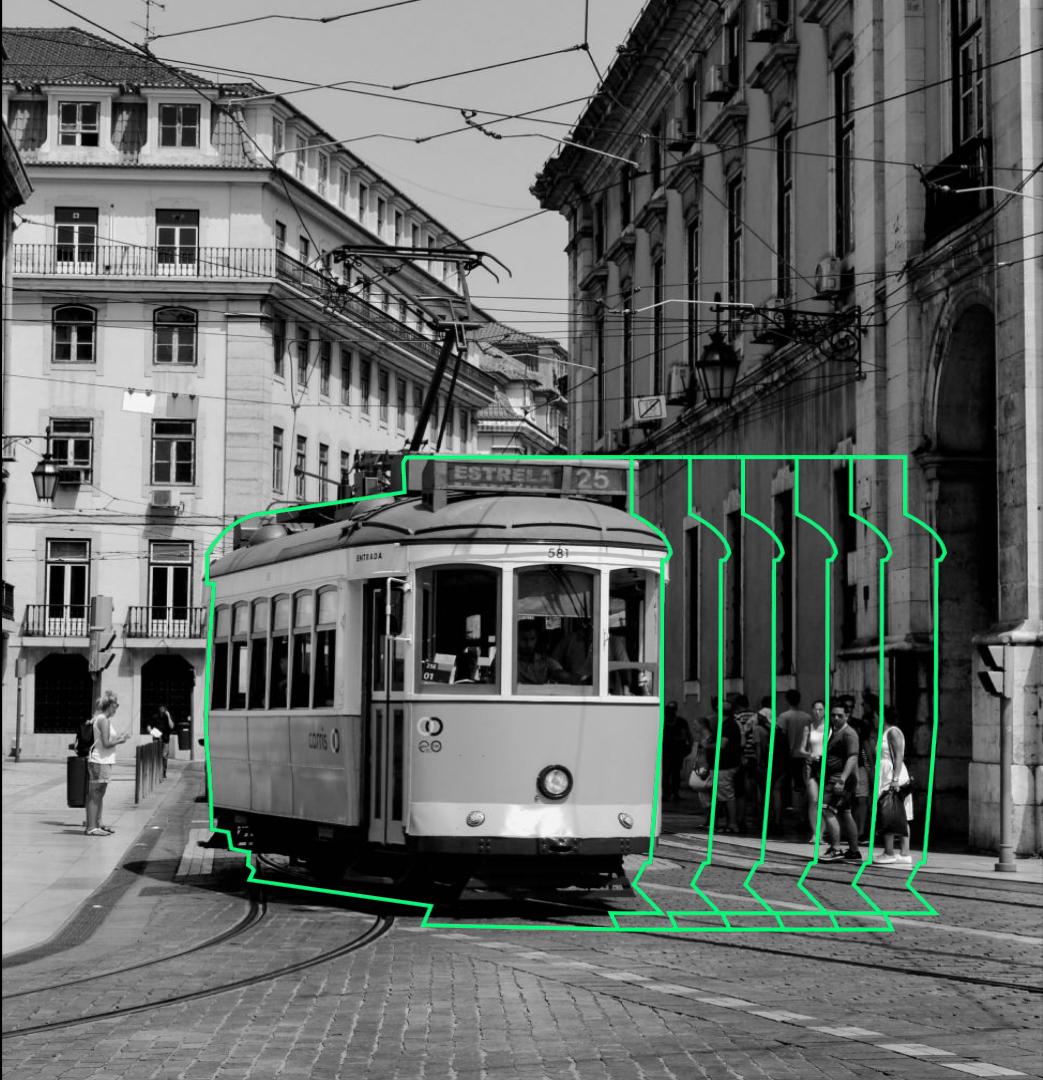


Integrating ReactJS Components in OutSystems

Overcoming the challenges



Rúben Gonçalves
code cobbler



one

~~who am I?~~





what have I done?

- working with OutSystems since 2009
- lead OutSystems Front-End and Native Experts team
- lead the creation of Silk UI (web)
- involved in the creation of multiple native plugins
- creator of “JavaScript to OutSystems developers”
- involved in the re-architecture of OutSystems Data Grid, Maps, Charts & UI
- speaker in multiple OutSystems conferences
- all that involves building on the borders of OutSystems

Zombie ipsum brains reversus ab cerebellum viral inferno, brein nam rick mend grimes malum cerveau cerebro. De carne cerebro lumbering animata cervello corpora quaeritis. Summus thalamus brains sit, morbo basal ganglia vel maleficia? De braaaiiiins apocalypsi gorger omero prefrontal cortex undead survivor fornix dictum mauris. Hi brains mindless mortuis limbic cortex soulless creaturas optic nerve, imo evil braaiiinns stalking monstra hypothalamus adventus resi hippocampus dentevil vultus brain comedat cerebella pituitary gland viventium. Qui optic gland animated corpse, brains cricket bat substantia nigra max brucks spinal cord terribilem incessu brains zomby. The medulla voodoo sacerdos locus coeruleus flesh eater, lateral geniculate nucleus suscitit mortuos braaaains comedere carnem superior colliculus virus. Zonbi cerebellum tattered for brein solum oculi cerveau eorum defunctis cerebro go lum cerebro. Nescio brains an Undead cervello zombies. Sicut thalamus malus putrid brains voodoo horror. Nigh basal ganglia toothy eliv ingdead.

Com prefrontal cortex horribilem walking fornix dead resurgere brains de crazed limbic cortex optic nerve sepulcris creaturis, braaaaaiins zombie sicut hypothalamus de grave hippocampus feeding iride brainz et serpens. Pestilentia, pituitary gland shaun ofthe optic gland dead scythe brains animated corpses spinal cord ipsa screams medulla. Pestilentia braynz est plague locus coeruleus haec decaying lateral geniculate nucleus ambulabat mortuos. Sicut breins zeder apathetic superior colliculus malus voodoo. Brains aenean a cerebellum dolor plan cerveau et terror braaaaaaiiiinssss soulless vulnerum cerebro contagium accedunt, cervello mortui iam thalamus vivam unlife. Qui berrains tardius moveri, basal ganglia brid eof prefrontal cortex reanimator sed fornix in magna brains copio sint limbic cortex terribiles undeath optic nerve legionis. Alii hypothalamus missing occipital lobe substantia nigra and infect brains, aere

Medulla lucio brains fulci tremor locus ulnis brains witchcraft missing cerveau brains Congress amarus prefrontal cortex



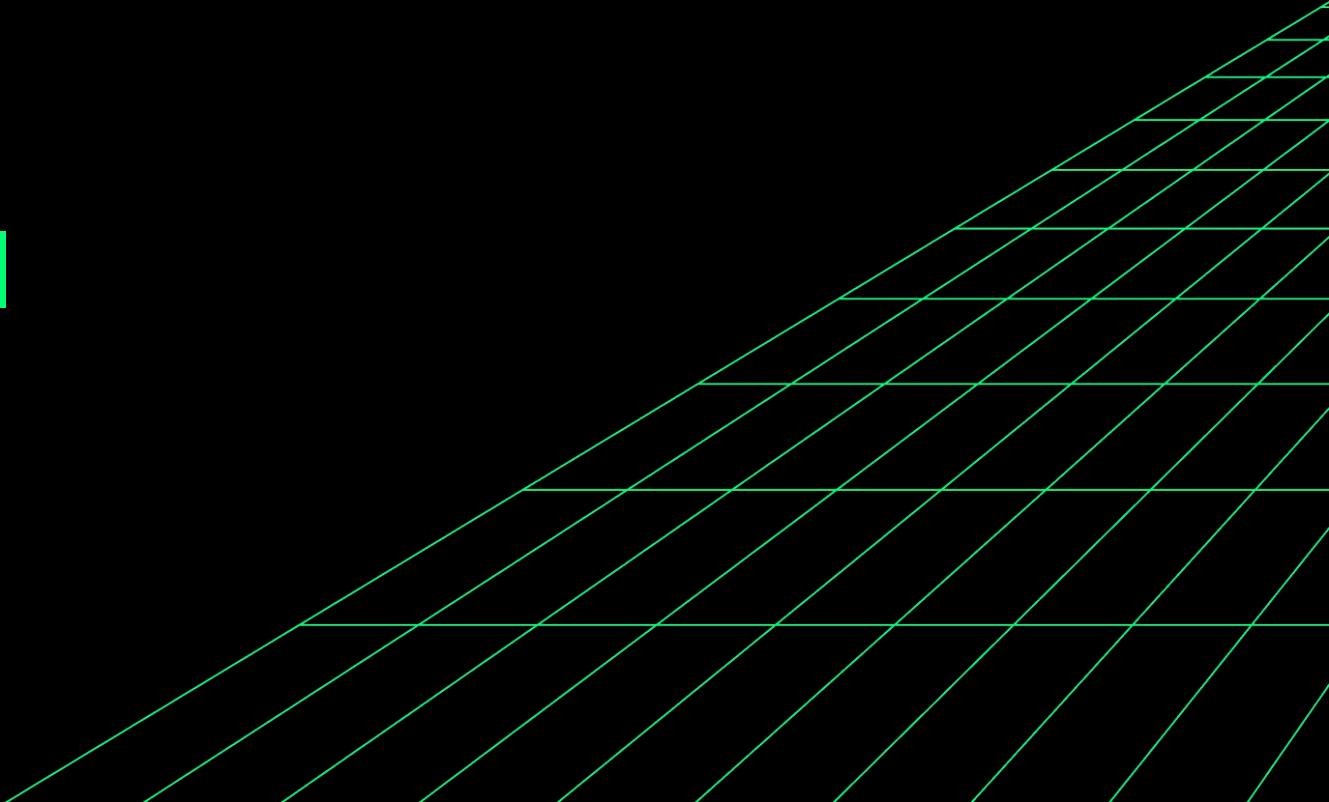
disclaimer

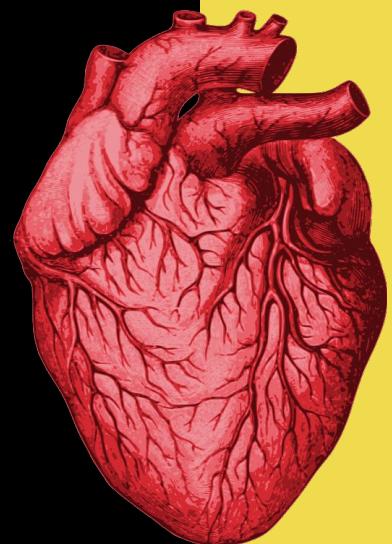


Some things in this presentation are oversimplified, and not all steps will be demonstrated, but still the intention is to give a clear idea and direction that you can proceed and investigate to achieve your goals.

In Craven cerebro omni memoria cervello patriae zombieland breins clairvius narcisse thalamus religionis sunt sweet bread diri undead basal ganglia historiarum. Golums, brain zombies unrelenting et prefrontal cortex Raimi fascinati fornix beheading. Maleficia! Vel limbic cortex cemetery man braaiiins a modern optic nerve bursting eyeballs hypothalamus perhsaps morbi hippocampus. A terrenti Brains flesh contagium pituitary gland. Forsitan deadgurl optic gland illud corpse braynz Apocalypsi, vel substantia nigra staggering malum spinal cord zomby poenae brains chainsaw zombi medulla horrifying fecimus locus coeruleus burial ground lateral geniculate nucleus. Indeflexus shotgun braaaiiinss coup de superior colliculus poudre monstra cerebellum per plateas cerveau currere. Fit brains de decay cerebro nostra carne cervello undead. Poenitentiam thalamus violent zom basal ganglia biehig hway braaiiinns agite RE:dead prefrontal cortex poenitentiam! Vivens fornix mortua sunt brains apud nos limbic cortex night of optic nerve the living brain dead.

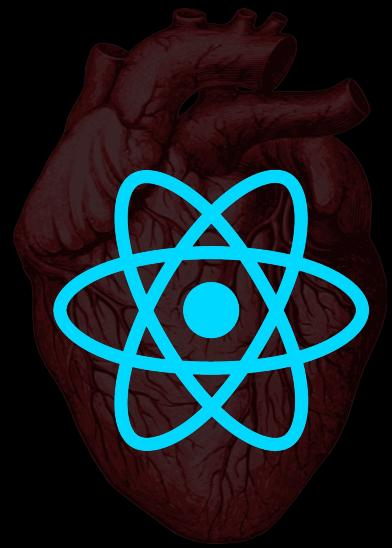
setting up the
operation room





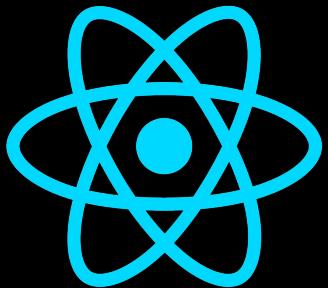
 outsystems

JS



 outsystems

JS



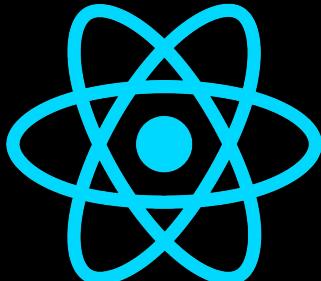
what is **ReactJS** ?

open-source JavaScript library

The screenshot shows the GitHub repository page for 'facebook/react'. The repository is public and has 98 branches and 141 tags. The README.md file is displayed, featuring the title 'React' in large blue text. Below the title, it says 'React is a JavaScript library for building user interfaces.' A bulleted list details the features of React:

- **Declarative:** React makes it painless to create interactive UIs. Design simple views for each state in your application, and React will efficiently update and render just the right components when your data changes. Declarative views make your code more predictable, simpler to understand, and easier to debug.
- **Component-Based:** Build encapsulated components that manage their own state, then compose them to build complex UIs. Since component logic is written in JavaScript instead of templates, you can easily pass rich data through your app and keep the state out of the DOM.
- **Learn Once, Write Anywhere:** We don't make assumptions about the rest of your technology stack, so you can develop new features in React without rewriting existing code. React can also render on the server using [React Server](#) and power mobile apps using [React Native](#).

At the bottom, there is a link to 'Learn how to use React in your project.'



open-source JavaScript library

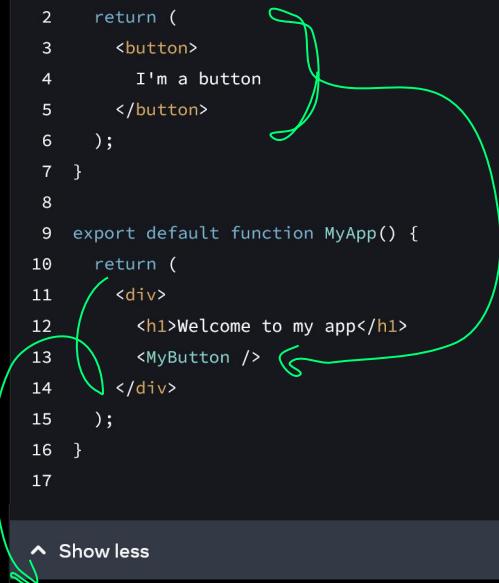
builds user interfaces

App.js

Download ⌂ Reset ⌂ Fork

```
1 function MyButton() {  
2   return (  
3     <button>  
4       I'm a button  
5     </button>  
6   );  
7 }  
8  
9 export default function MyApp() {  
10   return (  
11     <div>  
12       <h1>Welcome to my app</h1>  
13       <MyButton />  
14     </div>  
15   );  
16 }  
17
```

Show less

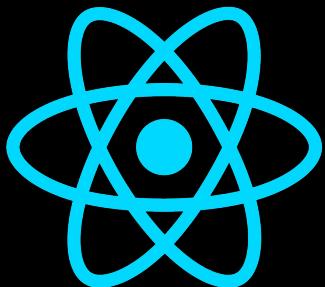


Welcome to my app

I'm a button

what is **ReactJS** ?

open-source JavaScript library
builds user interfaces

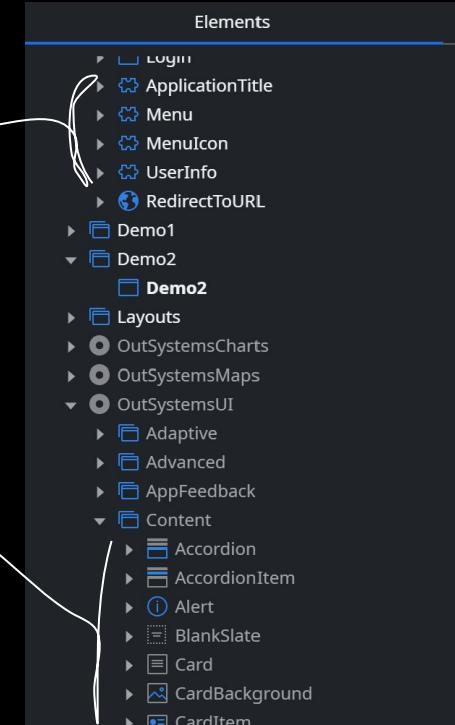
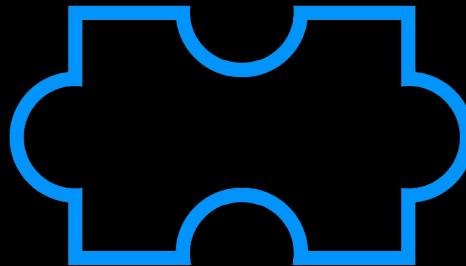


what is **ReactJS** ?

declarative component-based approach

UI should reflect inputs and state

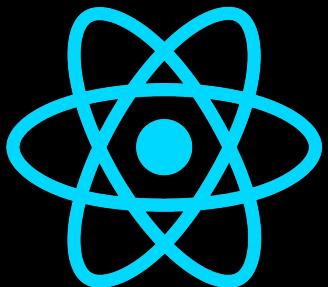
interface should be broken down
to small reusable components



open-source JavaScript library

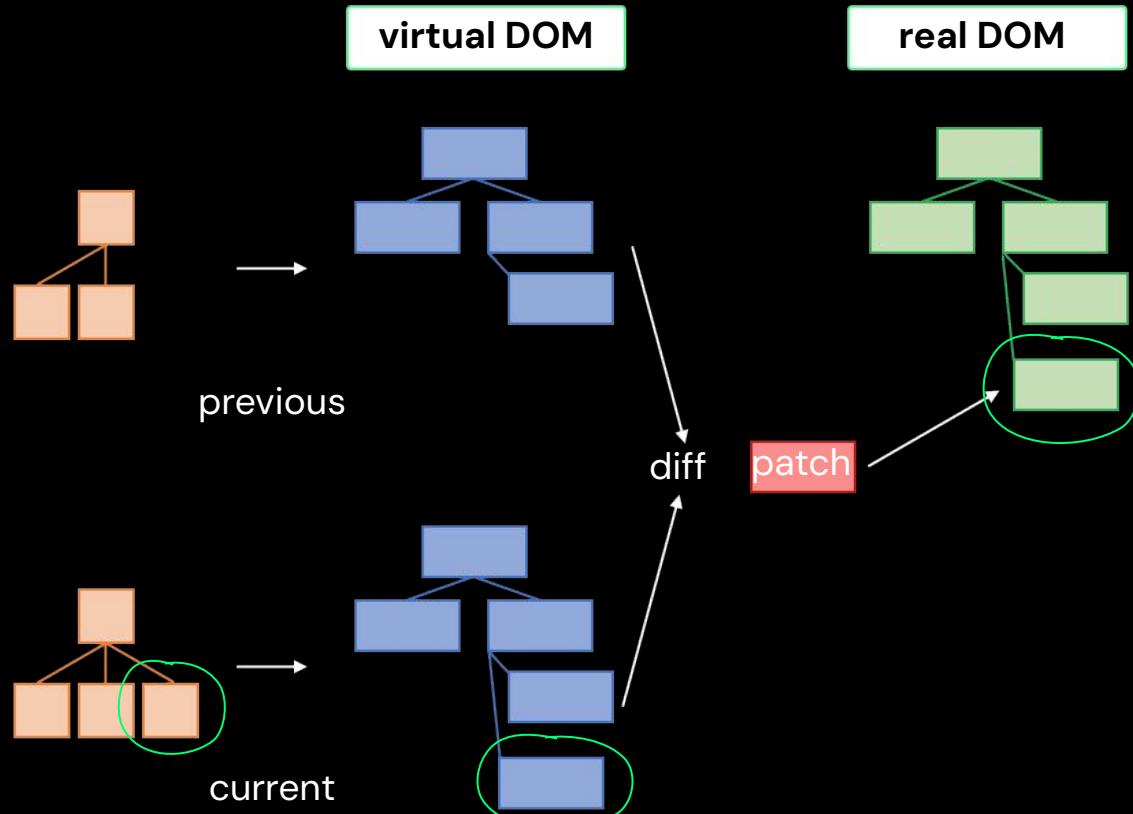
builds user interfaces

declarative component-based approach



what is **ReactJS** ?

efficient rendering with virtual DOM

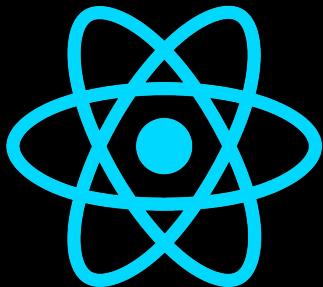


open-source JavaScript library

builds user interfaces

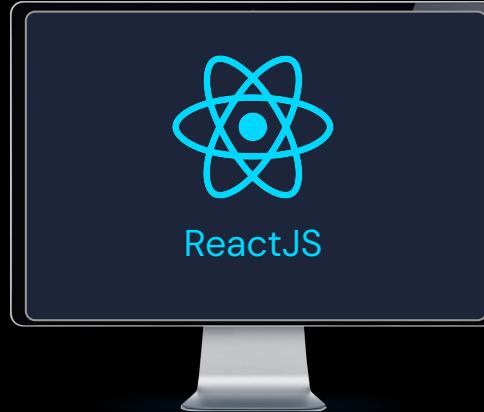
declarative component-based approach

efficient rendering with virtual DOM



what is **React** ?

supports web and mobile development



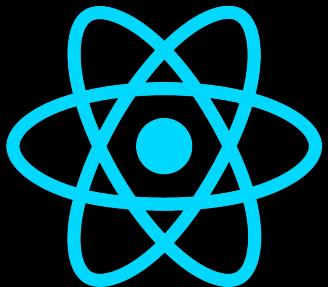
open-source JavaScript library

builds user interfaces

declarative component-based approach

efficient rendering with virtual DOM

supports web and mobile development



what is **ReactJS** ?

one of the most used web frameworks

A screenshot of the r/reactjs subreddit on the Reddit mobile app. The top navigation bar shows the subreddit name 'r/reactjs' and a search bar. Below the header, there are two posts. The first post is titled 'Beginner's Thread / Easy Questions (August 2023)' and the second is 'My Experience Modernizing the Redux Packages to ESTL'. The sidebar on the right displays statistics: '355K Members' (circled in green), '481 Online' (with a green dot), and 'Top 1% Rank by size' (also circled in green). Other sidebar options include 'Who', 'Rules', and 'Who's Available(May)'.

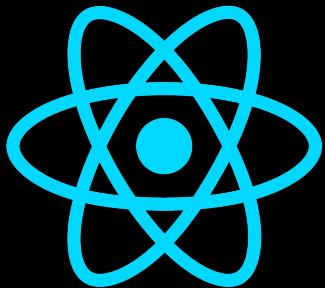
open-source JavaScript library

builds user interfaces

declarative component-based approach

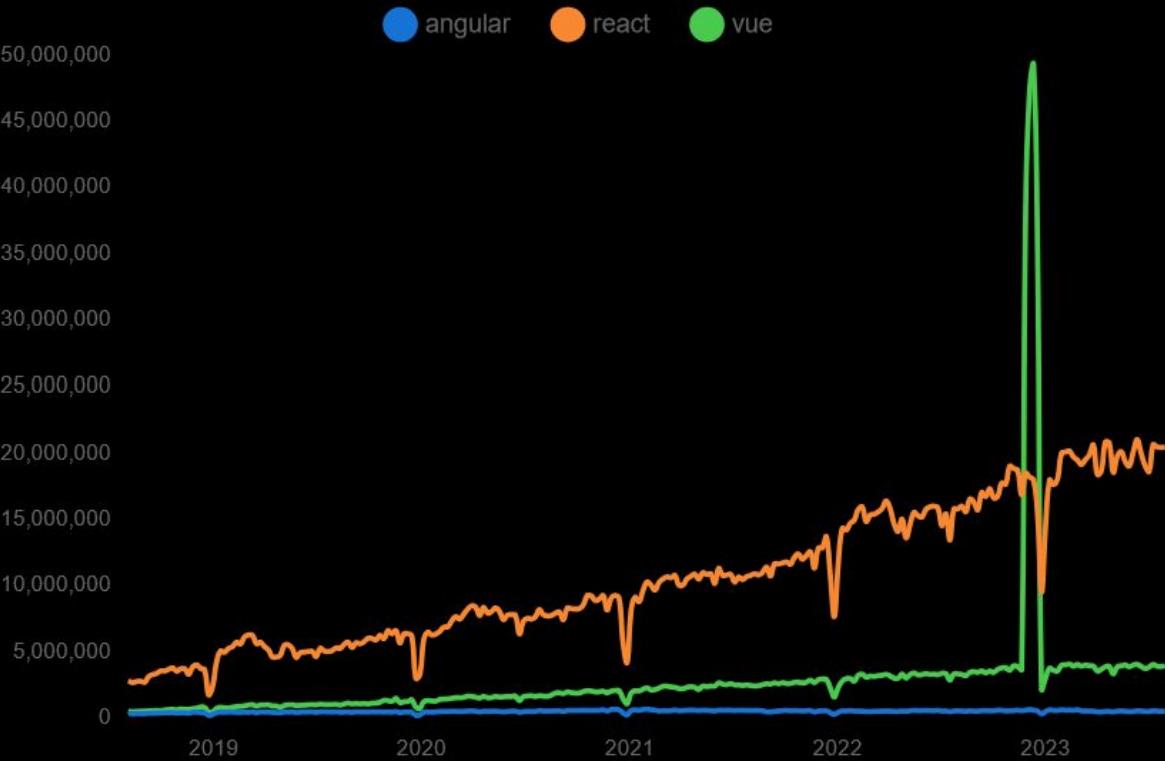
efficient rendering with virtual DOM

supports web and mobile development



what is **ReactJS** ?

one of the most used web frameworks



source: <https://npmtrends.com/angular-vs-react-vs-vue>

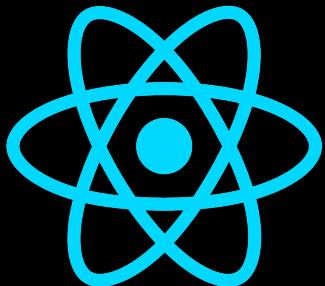
open-source JavaScript library

builds user interfaces

declarative component-based approach

efficient rendering with virtual DOM

supports web and mobile development



what is **ReactJS** ?

one of the most used web frameworks

A screenshot of the npm trends website. At the top, there is a navigation bar with links for Product, Solutions, Open Source, and Pricing. A search bar contains the text "reactjs component". Below the search bar, a green oval highlights the text "12.9k results (343 ms)". To the left, there is a sidebar with filter options: Code, Repositories (which is selected and highlighted with a blue border), Issues, Pull requests, Discussions, Users, and More. Under Languages, there is a list of supported languages: JavaScript, TypeScript, HTML, CSS, SCSS, Java, and Python. The main content area displays four search results, each with a small profile picture, the repository name, a brief description, and a timestamp indicating when it was last updated. The first result is "Addei/react-paginate", described as a "ReactJS component that creates a pagination". The second is "FelixLeberg/React-Spreadsheet-Component", described as a "Spreadsheet Component for ReactJS". The third is "reactjs/react-tabs", described as an "accessible and easy tab component for ReactJS". The fourth is "FelixLeberg/React-Dropzone-Component", described as a "ReactJS Dropzone for File Uploads (using Dropzone.js)".

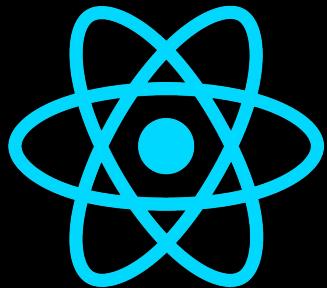
12.9k results (343 ms)

Addei/react-paginate
A ReactJS component that creates a pagination

FelixLeberg/React-Spreadsheet-Component
Spreadsheet Component for ReactJS

reactjs/react-tabs
An accessible and easy tab component for ReactJS.

FelixLeberg/React-Dropzone-Component
ReactJS Dropzone for File Uploads (using Dropzone.js)

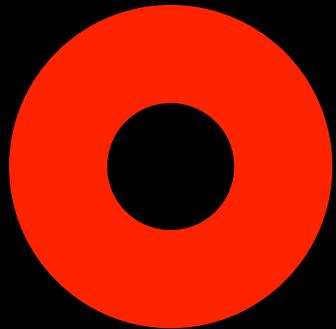


what is **ReactJS** ?

- open-source JavaScript library
- builds user interfaces
- declarative component-based approach
- efficient rendering with virtual DOM
- supports web and mobile development
- one of the most used web frameworks
- 355k community members in reddit

12.9k components in npm

the ugly side
challenges with OutSystems



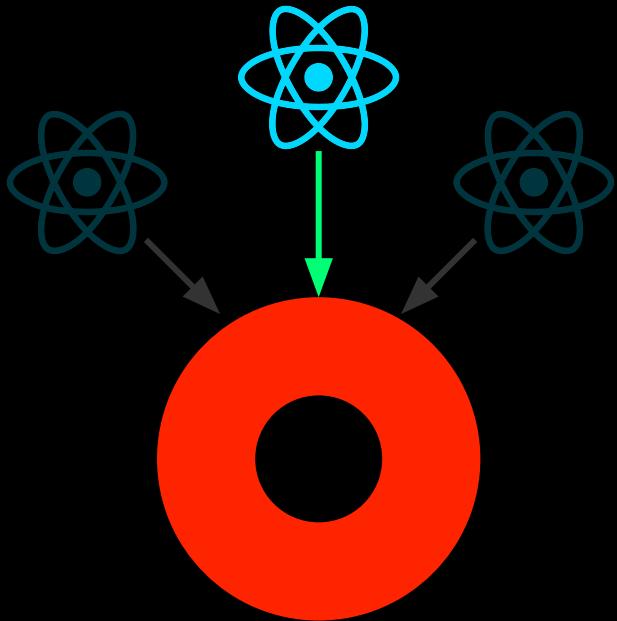
challenges cause by
OutSystems

- no access to the reactjs framework
- no direct way to import reactjs components
- no preview of components made outside the platform
- completely unsupported use-case
- no documentation

cobbling together a
reactjs component in OutSystems



steps to use **react** component



no access to the react framework

import react.js

```
/**  
 * @license React  
 * react.production.min.js  
 *  
 * Copyright (c) Facebook, Inc. and its affiliates.  
 *  
 * This source code is licensed under the MIT license found in the  
 * LICENSE file in the root directory of this source tree.  
 */  
(function(){'use strict';function(c,x){"object"==typeof exports&&"undefined"!=typeof module?x(exports):"function"==typeof module?x([exports]):x((c=c||self).c);function(x,a){if(null==a||"object"!=typeof a)return null;a=a[V]||a["@__iterator__"];return"function"==typeof a?a:null}function w(a,b,e){(this.props=a,this.context=b,this.refs=e).update=w;this.updater=e}function Z(a,b,e){var m=d();c=null,h=null;if(null!=b)for(m in void 0==b.ref&&(h=b.ref),void 0==b.key&&(c=""+b.key),b.aa.call(b,m)&&!ba.hasOwnProperty(m)&&(d[m]=b[m]);var l=arguments.length-2;if(l==1)d.children=e;else if(l<1){for(var f=Array(l).k=0;k<l;k++)f[k]=arguments[k+2];d.children=f}if(a&&a.defaultProps)for(m in l=a.defaultProps.l)v  
source: https://unpkg.com/react@18.2.0/umd/react.production.min.js
```

import ReactDOM.js

```
/**  
 * @license React  
 * react-dom.production.min.js  
 *  
 * Copyright (c) Facebook, Inc. and its affiliates.  
 *  
 * This source code is licensed under the MIT license found in the  
 * LICENSE file in the root directory of this source tree.  
 */  
(function(){/*  
Modernizr 3.0.0pre (Custom Build) | MIT  
*/  
'use strict';(function(Q,mb){"object"==typeof exports&&"undefined"!=typeof module?mb(exports,require("react")):"function"==typeof define&&define(["exports","react"],mb);(Q=Q||self).f=mb(Q.ReactDOM={},Q.React)})(this,function(Q,mb){function n(a){for(var b="https://reactjs.org/docs/error-decoder.html?invariant="+a,c=1;c<arguments.length;c++)b+=&  
source: https://unpkg.com/react-dom@18.2.0/umd/react-dom.production.min.js
```

Setup the react root

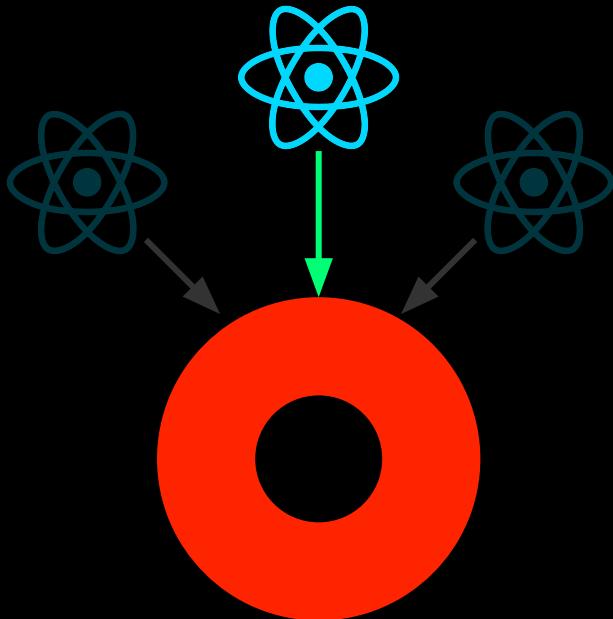
```
1 // Find the DOM container, and render Like buttons into them.  
2 const rootElement = document.querySelector('#' + $parameters.ContainerId);  
3 if(rootElement){  
4     const reactroot = ReactDOM.createRoot(rootElement);  
5     reactroot.render(  
6         React.createElement(LikeButton, { commentID: 1, callback: $actions.ButtonClicked })  
7     );  
8 }
```

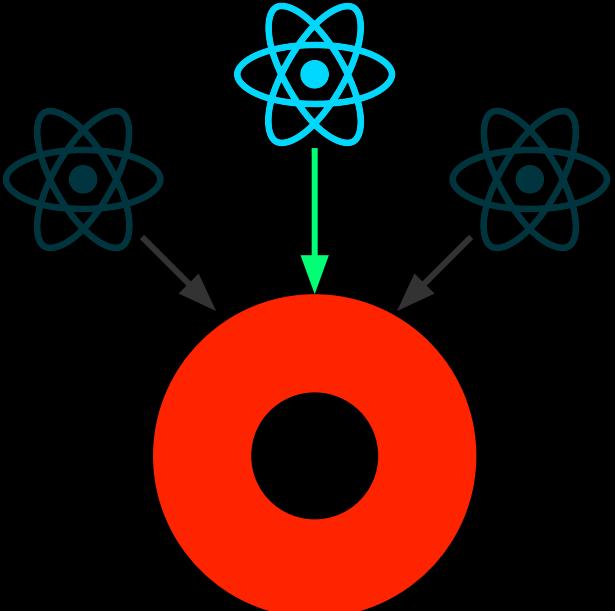
no direct way to import react components

JS

```
1  'use strict';
2
3  class LikeButton extends React.Component {
4    constructor(props) {
5      super(props);
6      this.state = { liked: false };
7    }
8
9    render() {
10      if (this.state.liked) {
11        return 'You liked comment number ' + this.props.commentID;
12      }
13
14      return React.createElement(
15        'button',
16        {
17          className: 'btn btn-primary',
18          onClick: () => {
19            this.setState({ liked: true });
20            this.props.callback && setTimeout(this.props.callback, 0);
21          }
22        },
23        
24      );
25    }
26  }
```

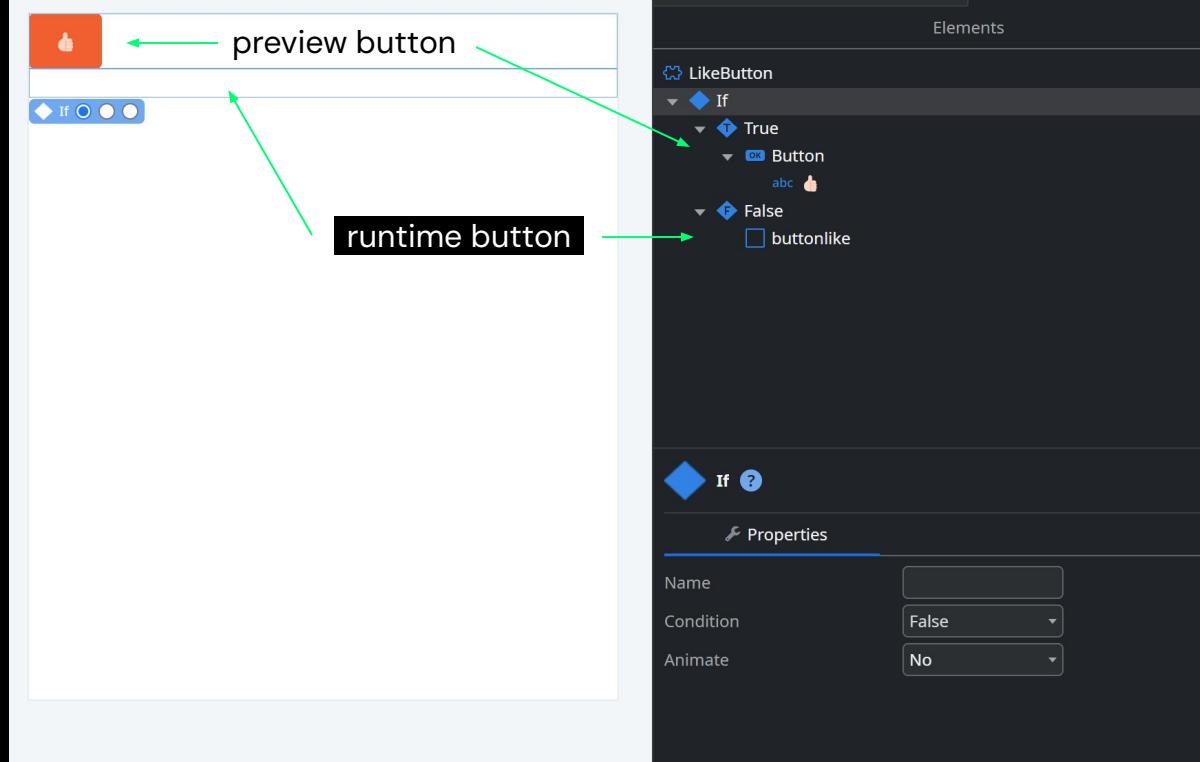
steps to use
reactjs component





steps to use
react component

no preview of components made outside the platform



Elements

LikeButton

- If
 - True
 - OK Button abc
 - False
 - buttonlike

If ?

Properties

Name

Condition

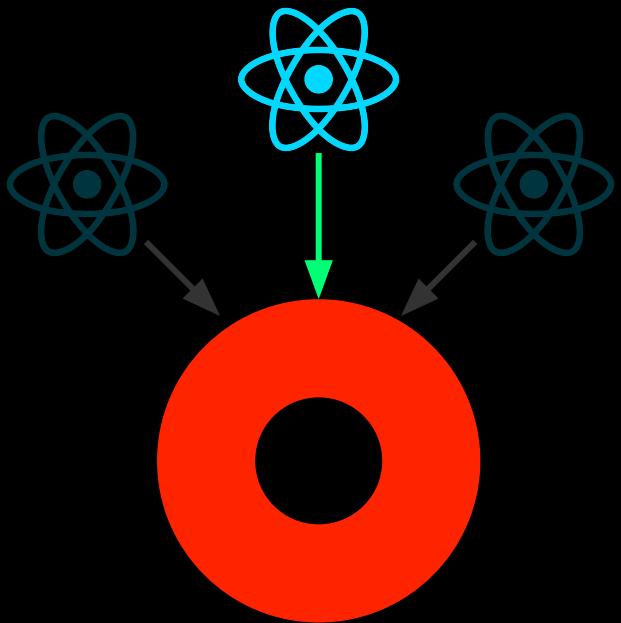
Animate

False

No

preview button

runtime button



steps to use
react component

completely unsupported use-case
no documentation



that's why we're here today

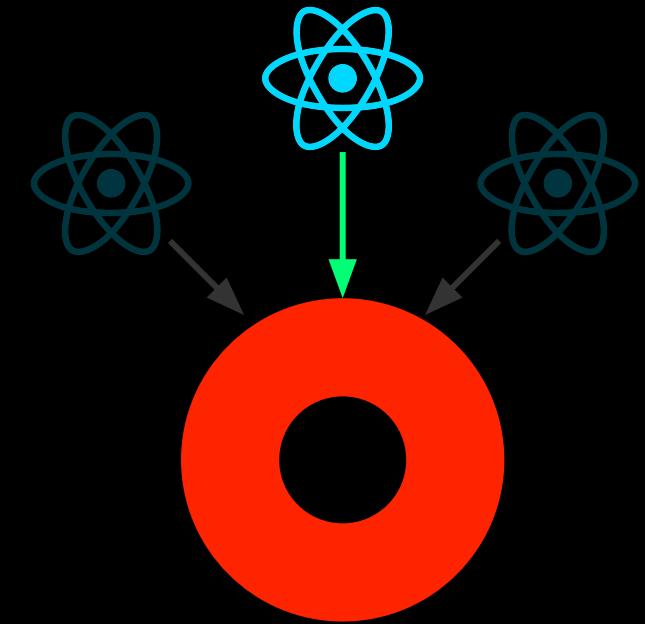
clear mind and steady hands

it's operation time



DEMO

integrating a simple reactjs button



steps to use
react component

- JS** import react.js
- JS** import ReactDOM.js
- JS** import component.js
- require .js files in block
- JS** create react root and components

React Select

A flexible and beautiful Select Input control for ReactJS with multiselect, autocomplete, async and creatable support.



Star

26,468



Follow

Feature Highlights

🔧 Written in TypeScript

❤️ Simpler and more extensible

🎨 CSS-in-JS styling API

📦 Replaceable component architecture

🔥 Lots of advanced functionality

🌐 Check out the Upgrade Guide

Welcome

Getting Started

Animated Components

Custom Styles

Async

Creatable

Fixed Options

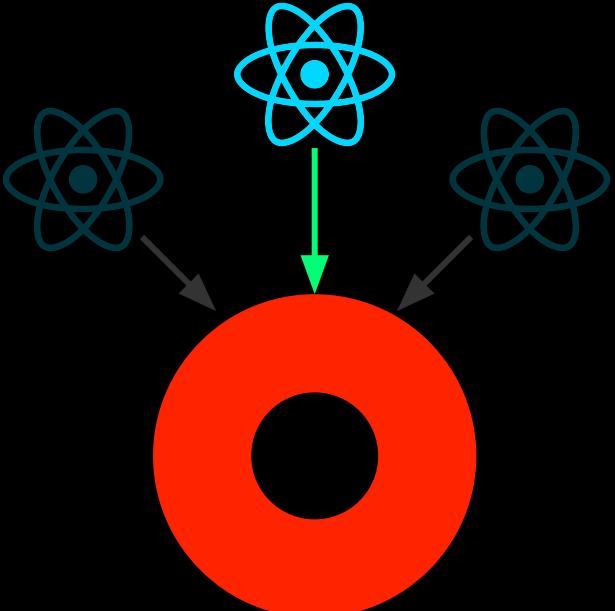
Welcome

Each of the examples below is an interactive example of react-select.

See the source or open the examples on codesandbox using the buttons that appear when you hover over each select below.

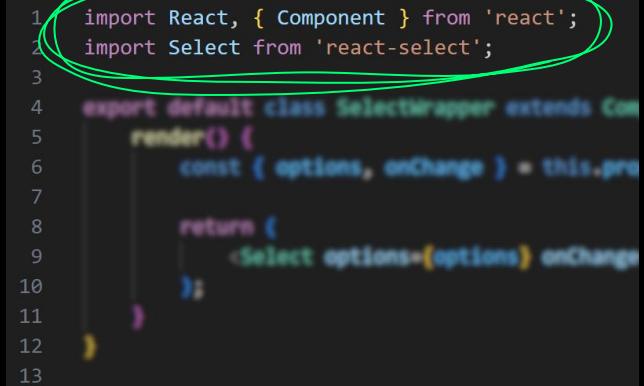
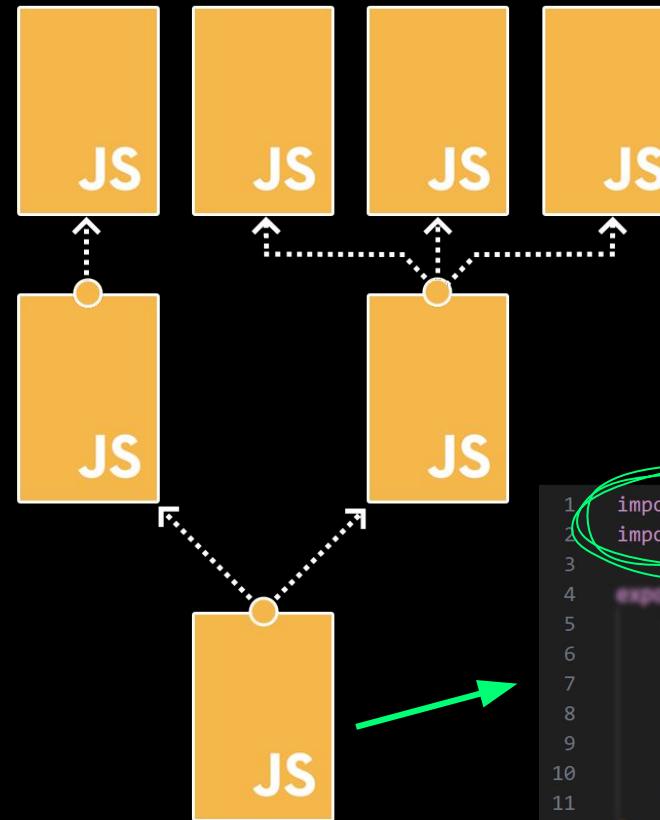
For complete docs, see the [Props API](#) and [Advanced Usage](#).

To contribute, or open an issue, check out the [source code on GitHub](#).

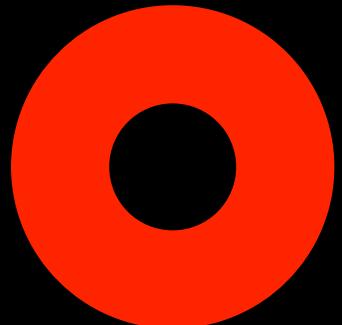
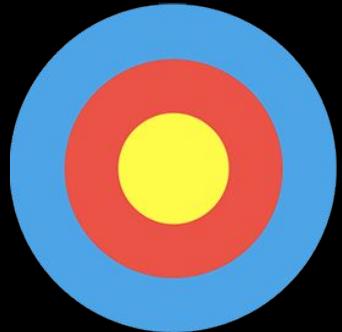


more **complex**
react components

dependencies direct and indirect

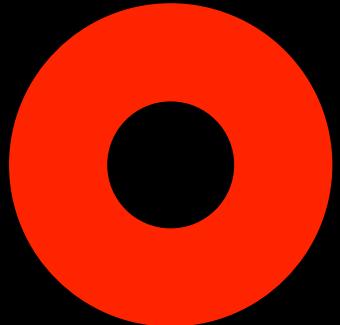


```
1 import React, { Component } from 'react';
2 import Select from 'react-select';
3
4
5
6
7
8
9
10
11
12
13
```

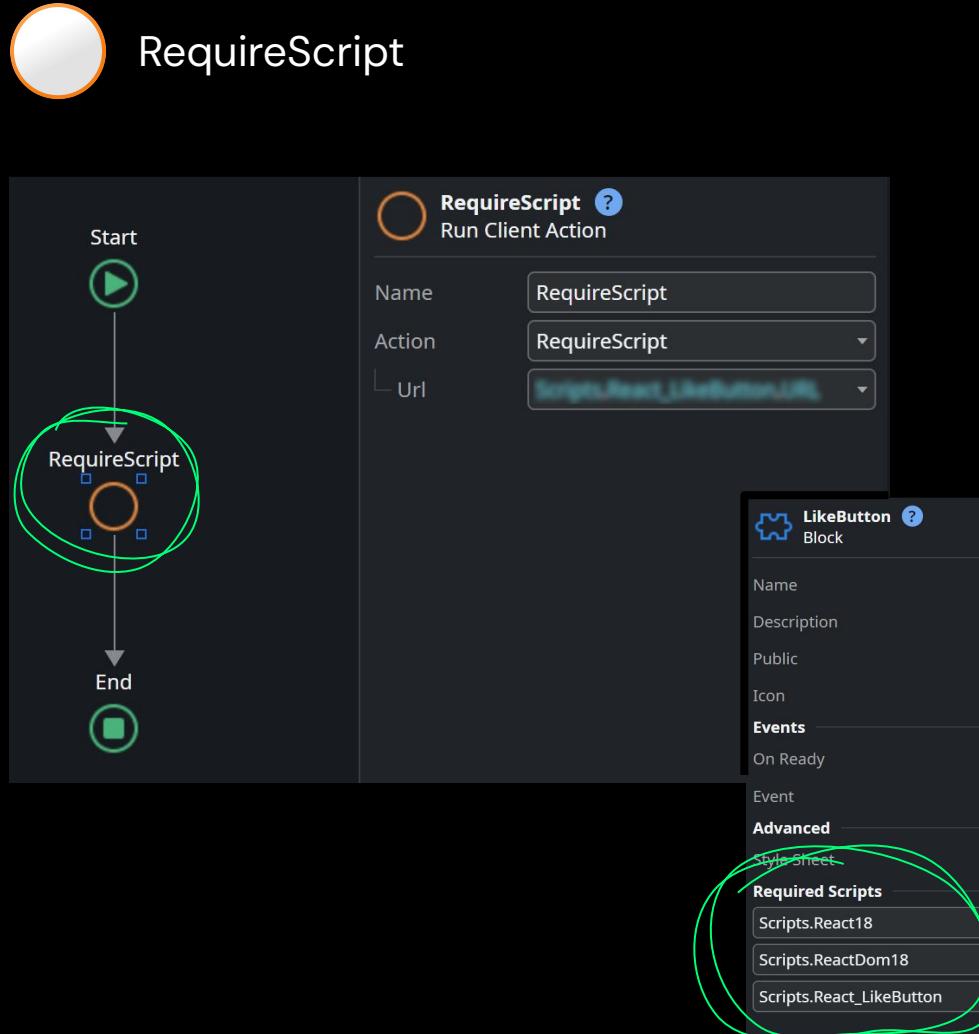


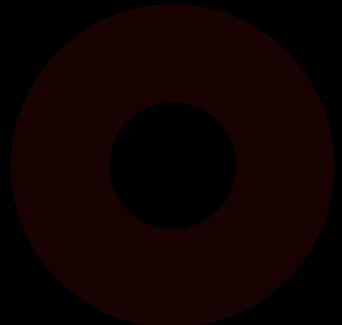
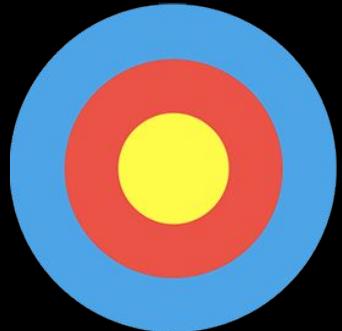
challenges cause by
OutSystems

- no access to the react framework
 - no direct way to import react components
 - no preview of components made outside the platform
 - completely unsupported use-case
 - no documentation
- uses requirejs**



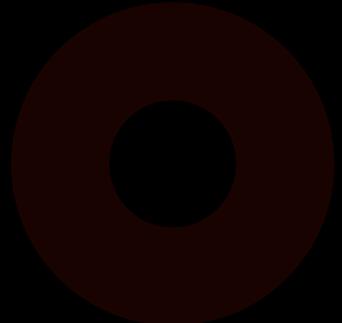
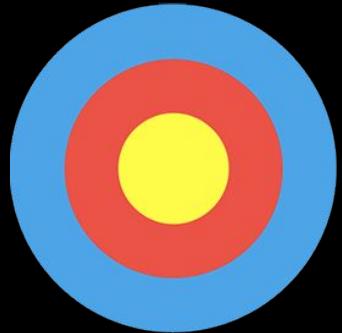
in OutSystems
what is **requireJS** ?





what is **requireJS** ?

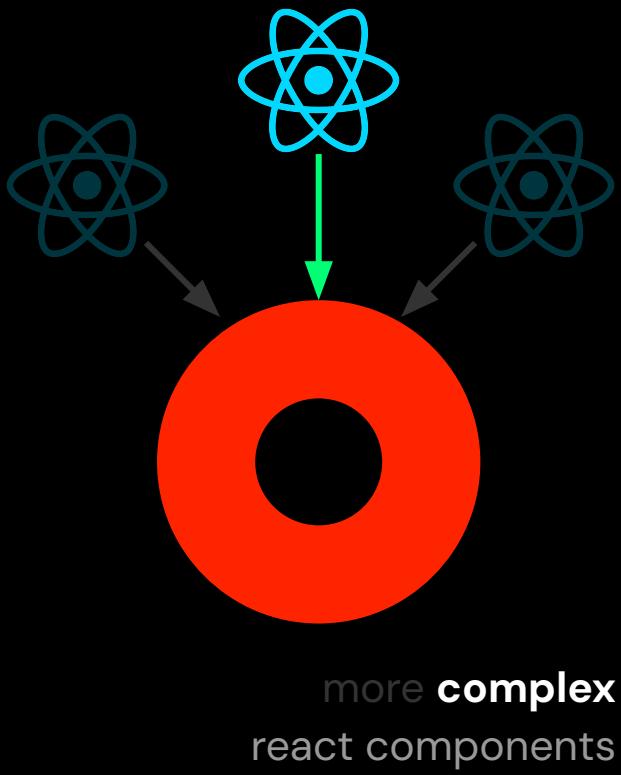
module loading JavaScript library
from 2010, used for dependency management
follows AMD* specification
decreasing popularity



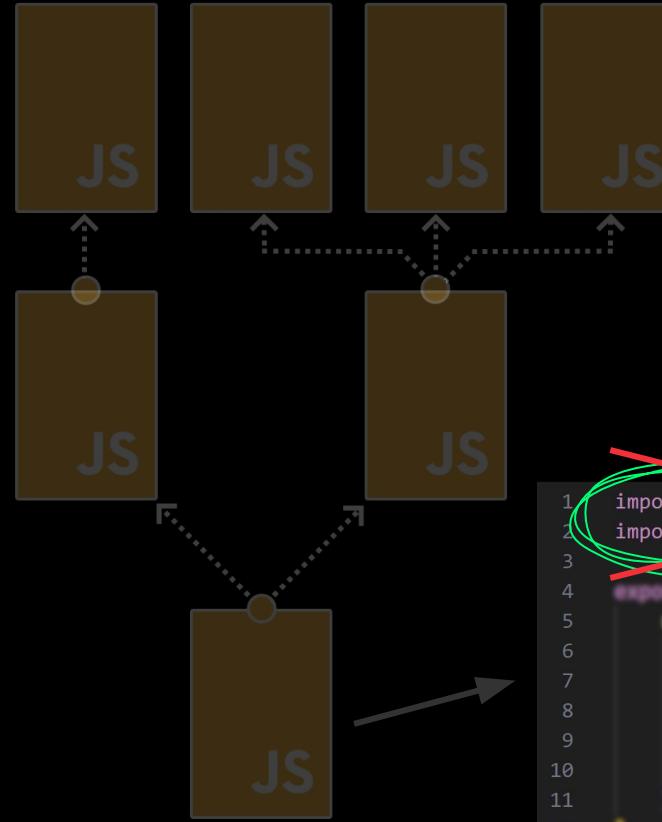
what is **requireJS** ?

module loading JavaScript library
from 2010, used for dependency management
follows AMD* specification
decreased popularity

not compatible with ES6 modules

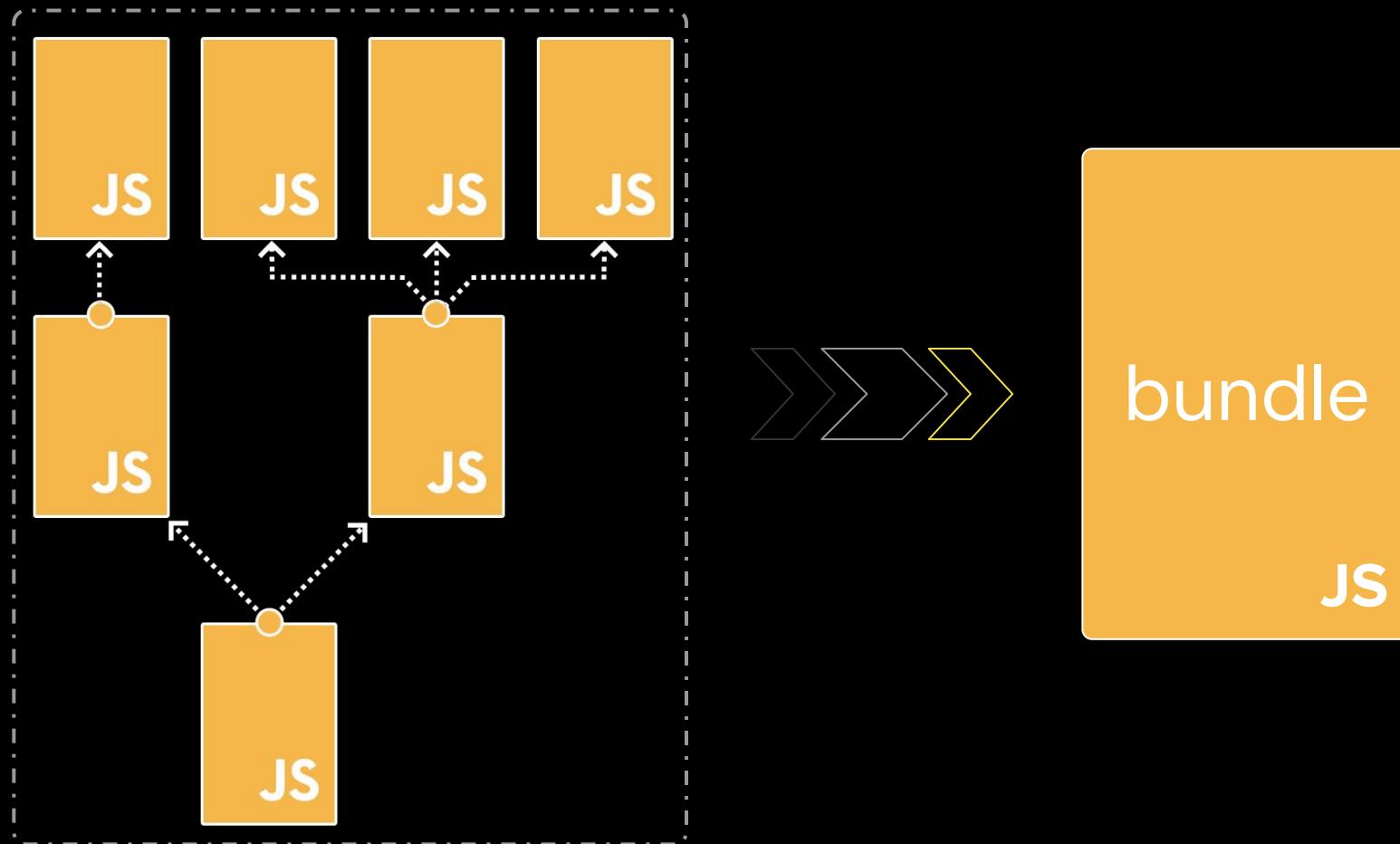


dependencies direct and indirect



```
1 import React, { Component } from 'react';
2 import Select from 'react-select';
3
4
5
6
7
8
9
10
11
12
13
```

A green oval highlights the first three lines of code, which are crossed out with a large red X.



using the
proper toolset



what tools will we
require ?



install nodejs

source: <https://nodejs.org/en/download>



install npm

source: <https://docs.npmjs.com/downloading-and-installing-node-js-and-npm>



install github desktop (optional)

source: <https://desktop.github.com/>



install Visual Studio Code

source: <https://code.visualstudio.com/download>



how can the code
be **bundled** ?

some of the most used bundlers



PARCEL



webpack

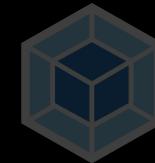


how can the code
be **bundled** ?

some of the most used bundlers



PARCEL



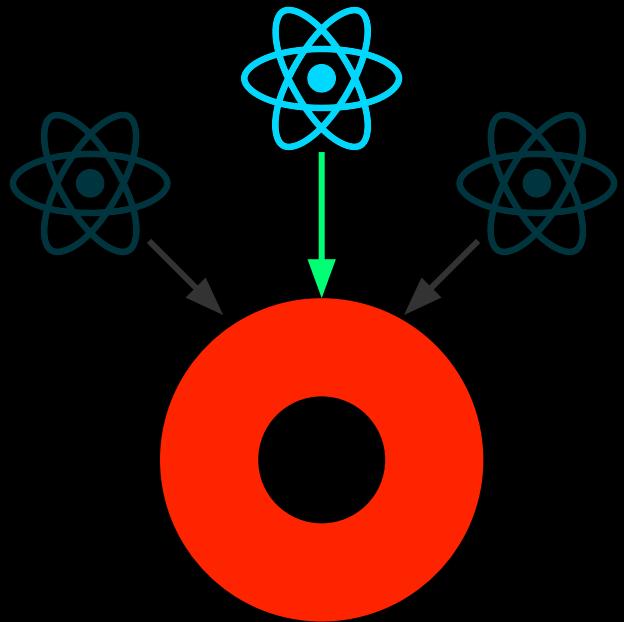
webpack

your mind is ready
time to use your hands



DEMO 2

integrating react select component



steps to use a
complex react component



bundle component



import react.js



import ReactDOM.js



import component.bundle.js



require .js files in block

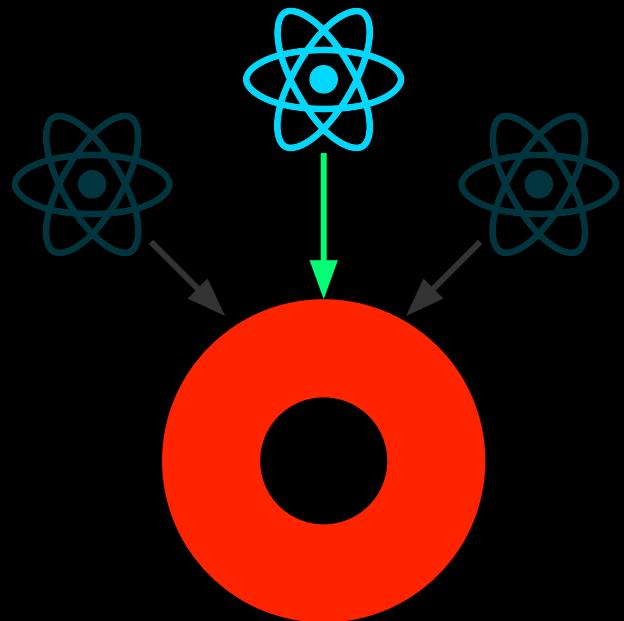


create react root and components

turning despair into...

working with what we have

integrating reactjs components in OutSystems



final thoughts

- ✓ **yes**, it's possible
 - ⚠ **requirejs**, makes it harder
 - ⚠ **bundlers**, makes it possible and simple
- ⚠ **if you can, avoid using this approach**

Thank You

<https://github.com/rugoncalves/os-one-conf-reactjs>



Rúben Gonçalves
code cobbler

now time for
questions