

Web Application Development for Industrial Engineers

การพัฒนาแอปพลิเคชันสำหรับวิศวกรอุตสาหกรรม

JavaScript Frameworks

What is a framework?

- A framework is a library that offers **opinions** about how software gets built.
- These opinions allow for **predictability** and **homogeneity** in an application.
 - Predictability allows software to scale to an enormous size and still be maintainable.
 - Predictability and maintainability are essential for the health and longevity of software.

Imperative and declarative programming

- **Imperative**
 - Tell a computer how to do something.
- **Declarative**
 - Describe to a computer what you want.

To do this

- List 1
- List 2
- List 3

Imperative programming

- JavaScript

```
const ul = document.createElement('ul');
for (let i = 1; i < 4; i++) {
  const li = document.createElement('li');
  li.textContent = `List ${i}`;
  ul.appendChild(li);
}
document.body.appendChild(ul);
```

Declarative

- Just use HTML

```
<ul>  
  <li>List 1</li>  
  <li>List 2</li>  
  <li>List 3</li>  
</ul>
```

But...

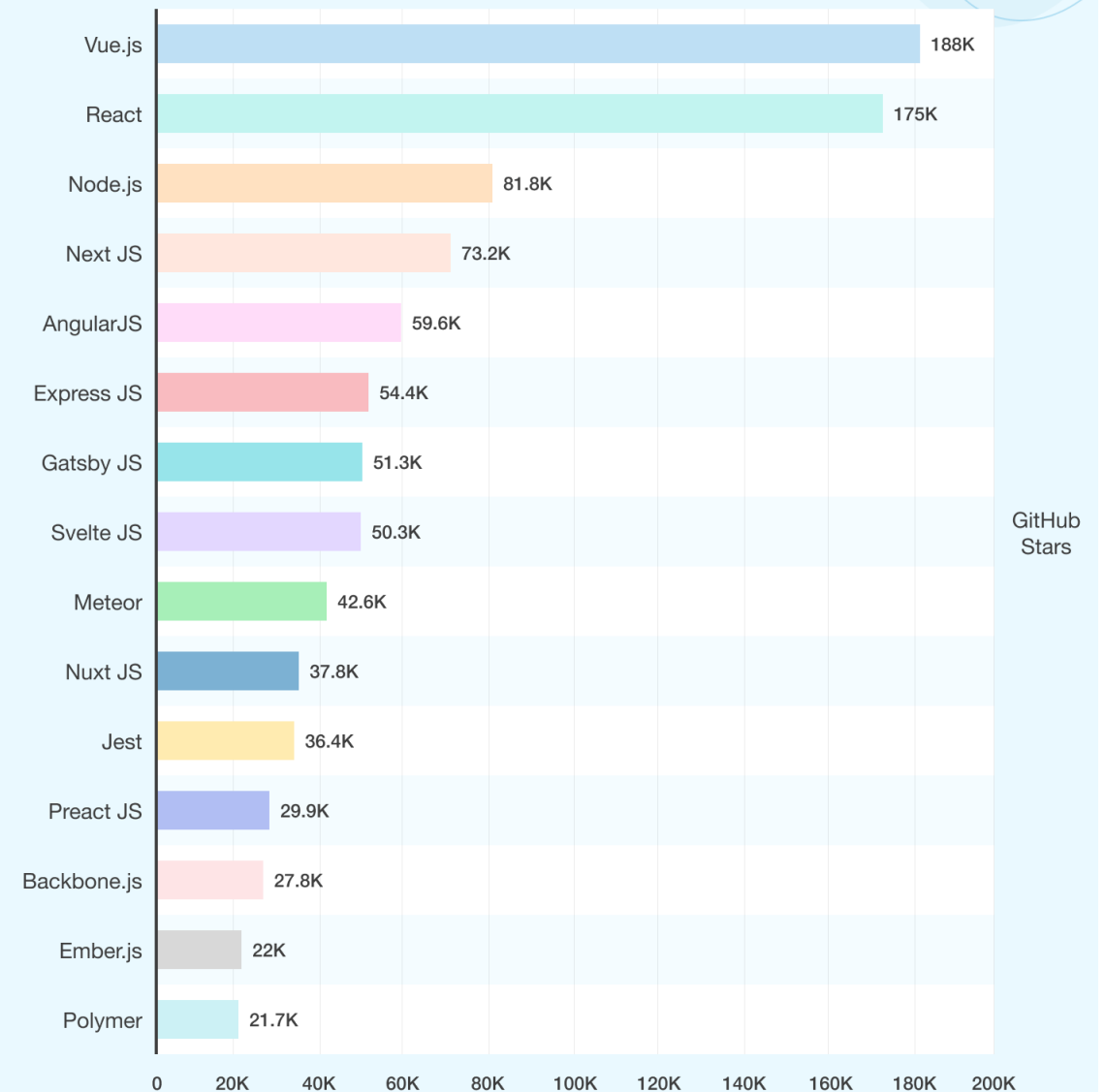
- `HTML` only works for static site.
- For dynamic web application, a **framework** can help us write code more **declaratively**.

Vanilla JS or Framework?

- Vanilla JS
 - A less complex site, for example a personal to-do list or a site that displays mostly static content
- Framework
 - A large site with a complex UI. Frameworks provide solutions to common problems that would take an absurd amount of time and patience to implement with pure JavaScript.

The state of JavaScript frameworks 2022

Most Popular Javascript Frameworks as per GitHub Stars



Job market

- <https://th.jobsdb.com>
- Try searching for `React` , `Vue` , `Angular` , ...

React

JSX

```
const element = <h1>Hello, world!</h1>;
```

- This is neither a string nor HTML.
- It is called JSX, and it is a syntax extension to JavaScript. - - This tells React to describe what the UI should look like.
- JSX produces React “elements”.
- [Source](#)

Virtual DOM

- Virtual DOM (VDOM) represents the DOM tree in memory.
- VDOM performs calculations and decides which elements of the actual DOM should be mutated.
 - Faster performance.
- [Source](#)

Current Virtual DOM



State Update

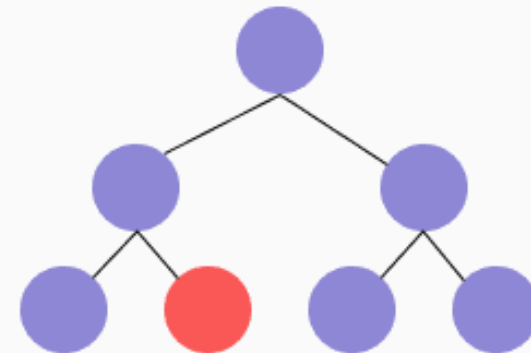


New Virtual DOM

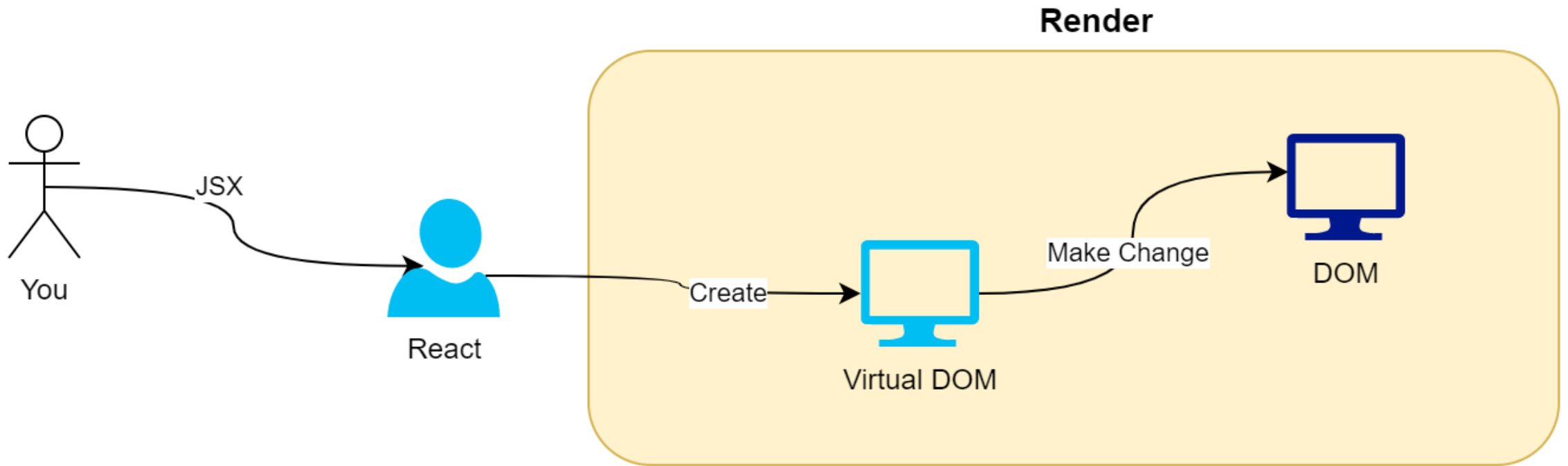


Only <Header /> changed

DOM

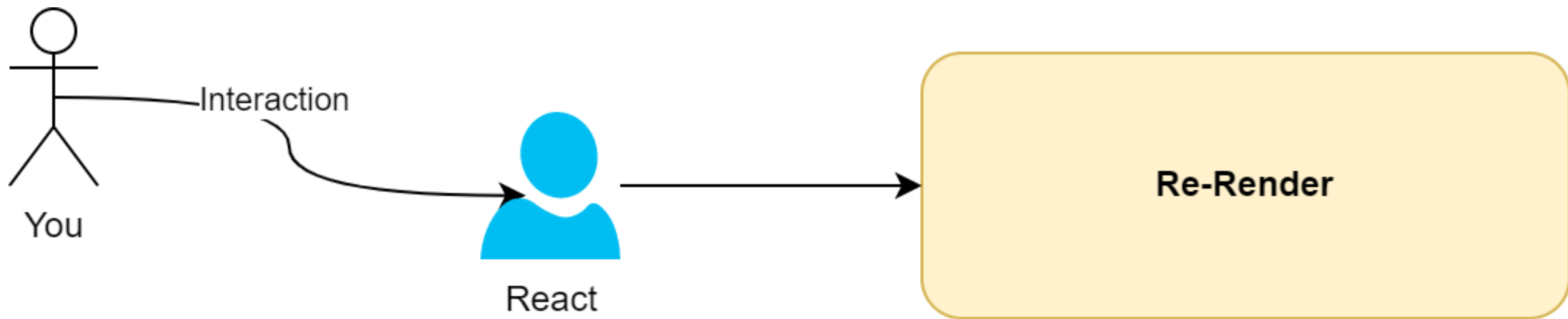


Only header is updated



Rendering process

- Rendering is a process that is triggered by a change of state in some component of your application, when a state change occurs React.
- See illustration in [Source](#).



Get started with **react**

<https://reactjs.org/docs/create-a-new-react-app.html>

```
npx create-react-app my-app  
cd my-app  
npm start
```

Online IDE

- <https://stackblitz.com/>
- <https://codesandbox.io/>