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Compassionate entrepreneur on a mission to end homelessness.
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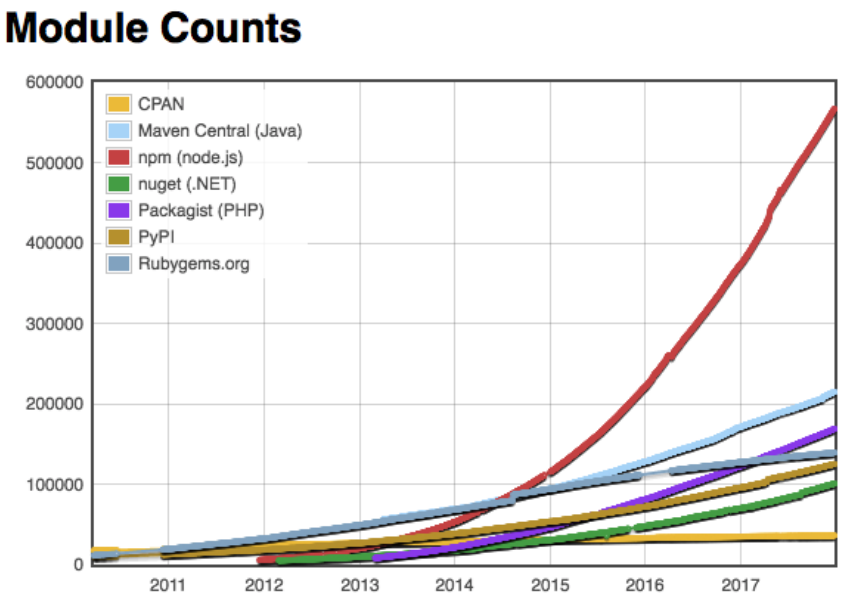
Top JavaScript Libraries & Tech to Learn in 2018

Alex Proimos — New York Public Library Grand Study Hall (CC BY 2.0)

Last year, I wrote an article rounding up the top tech to learn in 2017. This year there are some surprises.

> *We set out to answer "which learning topics will give you the highest chance of a return on the time you invest learning them?"*



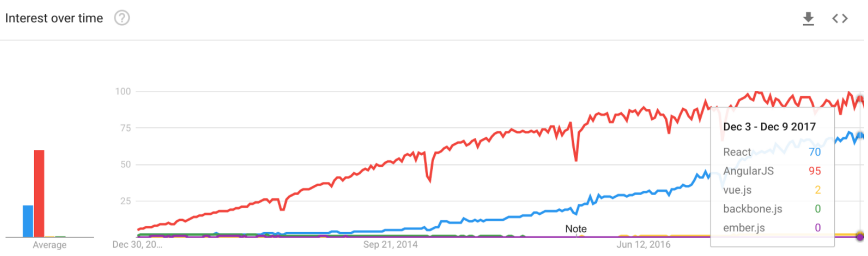
JavaScript has the most packages, by a landslide.

First, software ate the world, the web ate software, and JavaScript ate the web. In 2018, React is eating JavaScript.

2018: The Year of React

React won the popularity battle in 2017.

There are still lots of developers working on Angular code bases, which shows up in Google trends:



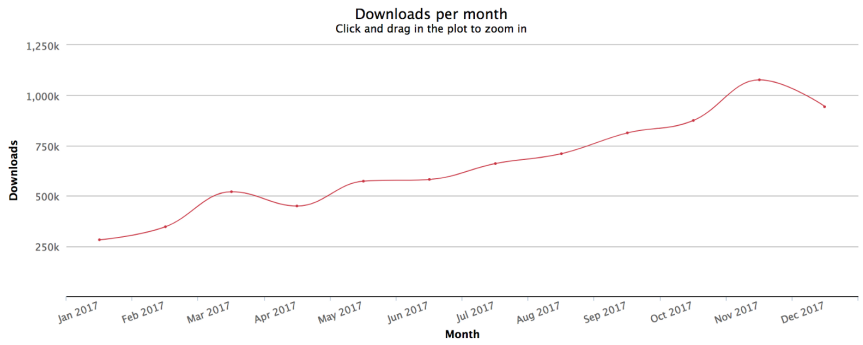
But as React continues to win customer satisfaction surveys, React growth has left Angular (and everything else) in the dust.

What About Vue.js? I Heard it's Hot

Everybody loves paying lip service to alternatives like Vue.js. Here's what I said about it last year:

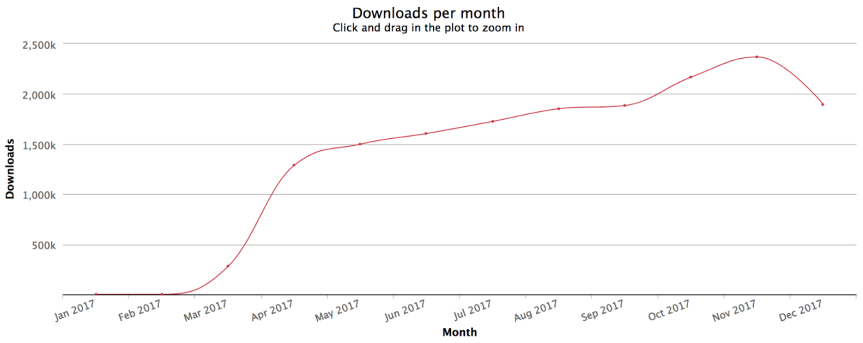
> ***Vue.js*** *has a ton of GitHub stars and downloads. If things continue the way they are going, it will do very well in 2017, but I don't think it will unseat either React or Angular (both of which are also growing fast) in the next year or so. Learn this* ***after*** *you have learned React or Angular.*

Vue.js did do very well in 2017. It got a lot of headlines and a lot of people got interested. As I predicted, it ***did not come close*** to unseating React, and I'm confident to predict it won't unseat React in 2018, either. That said, it could overtake Angular in 2018:



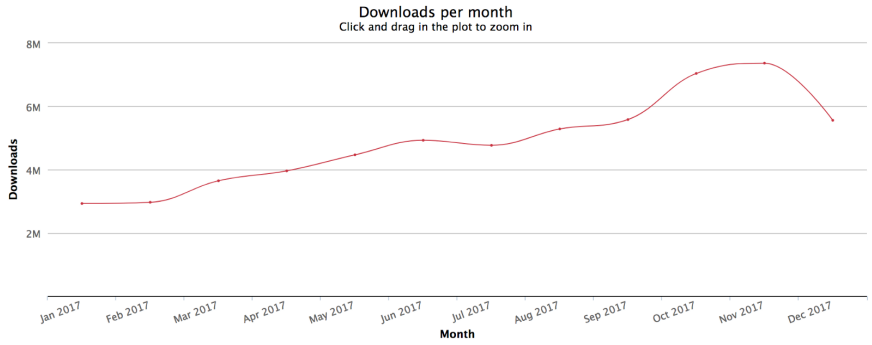
Vue.js downloads/month

As you can see, Vue.js is gaining on Angular downloads:



angular/core downloads/month

But React has a strong lead and a strong growth rate to match:



React downloads/month

Vue.js is still growing faster than React. Why should it be any different than React vs Angular in 2017?

At the end of 2016, the JavaScript world was ready for a new framework. Angular users were very unsatisfied, React users were very satisfied, lots of people wanted to learn React, and very few wanted to learn Angular. At the end of 2017, Angular 2+ user satisfaction is still less than half, at 49%.

The story is very different for React vs Vue.js. React is beating Vue.js in user satisfaction (93% to 90%). The big incentive to switch from React in early 2017 was because of confusion over the React license. Facebook heard the users and switched the license.

At this stage, I simply don't see compelling evidence that the market is motivated to switch from React to anything else. Vue.js is going to have a much harder time stealing users from React than they are having stealing users from jQuery and Angular.

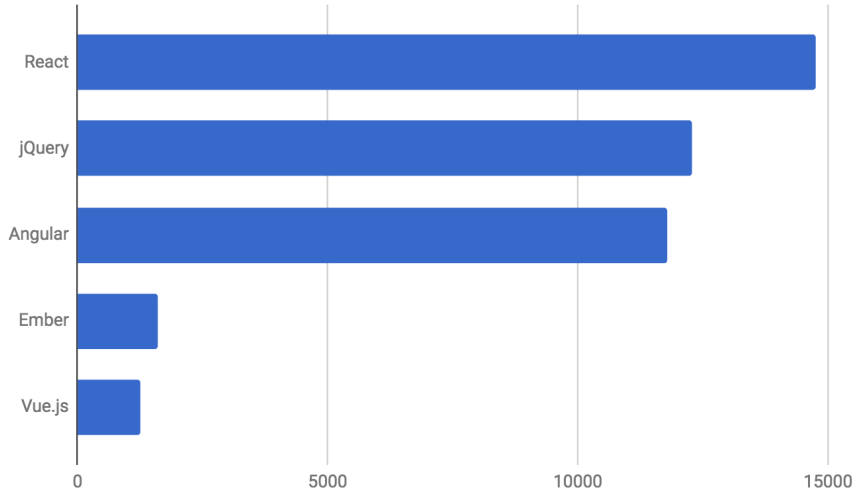
There's plenty of room for Vue.js to pick up a lot of Angular and jQuery users at a fast clip, but they will likely hit a brick wall when they have to start stealing users from React to continue the growth streak.

I predict strong Vue.js growth for another year or two, followed by a much harder battle with React in the top spot and Vue.js relegated to second fiddle unless something big changes to upset the balance.

Jobs

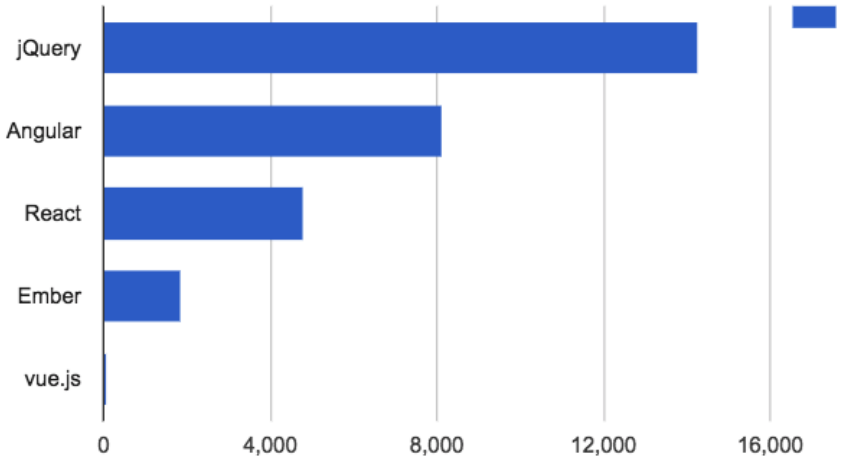
jQuery has fallen.

In the job listings, React completely took off and blew right past jQuery —the ***first library to pass jQuery in job popularity in a decade***.[1] What we're witnessing here is the end of an era.



React Rising—the first library to unseat jQuery this decade (source: Indeed.com)

Compare to last year's chart:



jQuery is so 2016

What's really interesting in these charts is that other libraries grew a lot more than jQuery fell. The total open jobs mentioning a front-end framework are up by more than ~10k over last year.

With the job growth, we have also seen a boost in average salaries, too: $110k compared to $93k at the end of 2016. The inflation rate for the same period stayed below 2%, accounting for only a small percentage of the salary boost.

Clearly, it's still a candidate's market in 2018.

> ***1. Methodology:*** *Job searches were conducted on Indeed.com. To weed out false positives, I paired searches with the keyword "software" to strengthen the chance of relevance, and then multiplied by ~1.5 (roughly the difference between programming job listings that use the word "software" and those that don't.) All SERPS were sorted by date and spot checked for relevance. The resulting figures aren't 100% accurate, but they're good enough for the relative approximations used in this article.*

Framework Recommendations

After looking at this year's numbers, I'm prepared to strongly recommend React for most general app development use cases, including mobile apps (PWAs, React Native), web applications, most office productivity applications, and desktop media content production apps (see Electron).

Notable category exceptions where something else may serve you better: Featherweight marketing landing pages (skip the framework entirely), 3D games, AR/VR. For 3D content, check out Unity, Unreal, or PlayCanvas. That said, React is being used for 3D content UIs, too.

I'm rating all other front-end frameworks strictly optional this year. This doesn't mean they're not cool, just not serious contenders to React in the job market. Remember, this list is about learning ROI, not which tech is the "best".

Why so Much Interest in React?

Browsing through the React job listings, I noticed an interesting trend —a lot of them were for things that we don't think of as front-end web work:

- React Native (for perspective, there are more of these openings than the total number of Vue.js openings)

- React for IoT
- React for AR/VR (with Oculus Rift leading the hiring charge)
- React for obscure computing thing you've never heard of

> *React has broken free of its web roots.*

Versatility is one of the big selling points of React. Unlike many other frameworks, buying into React doesn't entail buying into some baked in data model, or even the browser or DOM itself. In fact, I found quite a few React job listings that didn't even mention JavaScript.

React also offers a rich, vibrant ecosystem piggybacking on React's de-facto standards—something the JavaScript world hasn't seen since jQuery plugins ruled the web.

> *The question is no longer "which framework?"*
> *The question is "which tech pairs best with React?"*

Nothing is going to unseat React in 2018 (maybe even 2019). You're safe. JavaScript fatigue seems to be settling down. We have a great framework to build apps on now, and there's a great ecosystem settling in around React.

Which Topics Should You Study?

Like last year, you can't go wrong focusing on the essentials, but you should place more emphasis on functional programming for React apps.

React is great for two primary reasons:

- Deterministic view renders
- Abstracting the view layer away from direct DOM manipulation

Determinism is best served by building applications using pure functions, which is essentially the definition of functional programming.

With that in mind, here are some topics you should study:

- **Basic ES6 syntax**
- **Class syntax and its many pitfalls**—It's OK to use `class` for React components, but avoid extending from your own classes, avoid `instanceof`, and avoid forcing users of your classes to use the `new` keyword.
- **Functional programming & software composition**
- **Currying**
- **Closures**
- **Pure functions**
- **Promises**
- **Generators** & **async functions**
- **TDD**
- **The RAIL performance model**
- **Progressive Web Applications (PWAs):** See "Native Apps are Doomed" & "Why Native Apps Really Are Doomed"
- **GraphQL** matured a lot in 2017, and is quickly taking over from REST APIs. Apollo is adding built-in offline first client cache architecture that will make Apollo+GraphQL a serious alternative (or complement) to Redux in 2018.

Libraries & Tools

These are the libraries and tools I'm finding most useful:

- **React**
- **Redux**
- **Redux-Saga** to manage async I/O and isolate side-effects
- **Next.js**—SSR with Node & Express, automatic bundle splitting, styled-jsx
- **Material UI**

- **Storybook**
- **Cheerio** for unit testing React components (I prefer this over Enzyme)
- **Lodash** (I prefer utilities from `lodash/fp`). Import just the utilities you need to avoid blowing up your bundle size.
- **Babel:** Used to compile ES6 to work on older browsers.
- **Webpack:** The most popular bundler for standard JavaScript look for simple starter kit/boilerplate config examples to get things running fast)
- **ESLint:** Catch syntax errors and style issues early. After code review and TDD, the third best thing you can do to reduce bugs in your code.
- **Ramda**—mostly for lenses and transducers.
- **Node & Express**
- **RxJS:** Observables for JavaScript. I've been using transducers more, lately. Remember to use pipeable operators to avoid blowing up your bundle size.

TypeScript did well in 2017, but I've seen it get in the way and complicate apps more than it helped. It's primary shortcomings are over reliance on annotations as opposed to inference, and an inability to properly type higher-order functions without indescribable contortions. I gave it a full-time daily trial for a while, but these still apply: "The Shocking Secret About Static Types" &"You Might Not Need TypeScript". Flow shares the same problems and the developer tools are not as good as TypeScript's.

Tech to Watch in 2018

All of these areas of R&D are creating real jobs in 2018:

- Progressive Web Apps (PWAs)
- Blockchain & fintech
- Medical technology

- AR/VR—Hololens, Meta, and ODG are shipping today. ODG R-9 was scheduled to ship in 2017 but will likely ship in 2018 instead. MagicLeap has promised to ship in 2018. AR will transform the human experience more than the cell phone did.
- 3D printing
- AI
- Drones

Quantum computing is also poised to transform the world, but it may be 2019 or later before the disruption really starts. There are working quantum computers online, but they can't do much yet. It's still too early for most developers to even begin to experiment productively. Microsoft recently announced its Q# programming language for quantum computing. Meanwhile, IBM and Google also continue to invest heavily to own the embryonic cloud quantum computing market.

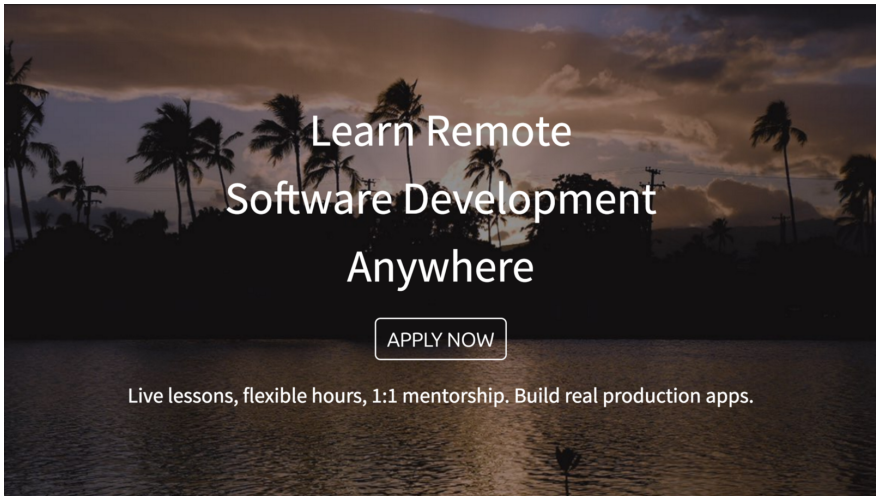
If you want to be prepared to learn quantum computing, you'll want to study up on linear algebra. There are also functional explorations of quantum computing based on lambda calculus.

It's likely that, as we've seen with AI, cloud APIs will be developed that will let people with less math background take advantage of some of the capabilities of quantum computing.

Need React Training for Your Team?

DevAnywhere offers live remote training plus 1:1 mentorship to teach the functional programming and software composition principles critical to getting the most from React.

- Live lessons
- Flexible hours
- 1:1 mentorship
- Build real production apps



https://devanywhere.io/

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Eric Elliott *is the author of "Programming JavaScript Applications" (O'Reilly), and cofounder of DevAnywhere.io. He has contributed to software experiences for* ***Adobe Systems****,* ***Zumba Fitness****,* ***The Wall Street Journal****,* ***ESPN****,* ***BBC****, and top recording artists including* ***Usher****,* ***Frank Ocean****,* ***Metallica****, and many more.*

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