Top JavaScript Frameworks and Tech Trends for 2021

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Dec 31, 2020 · 11 min read

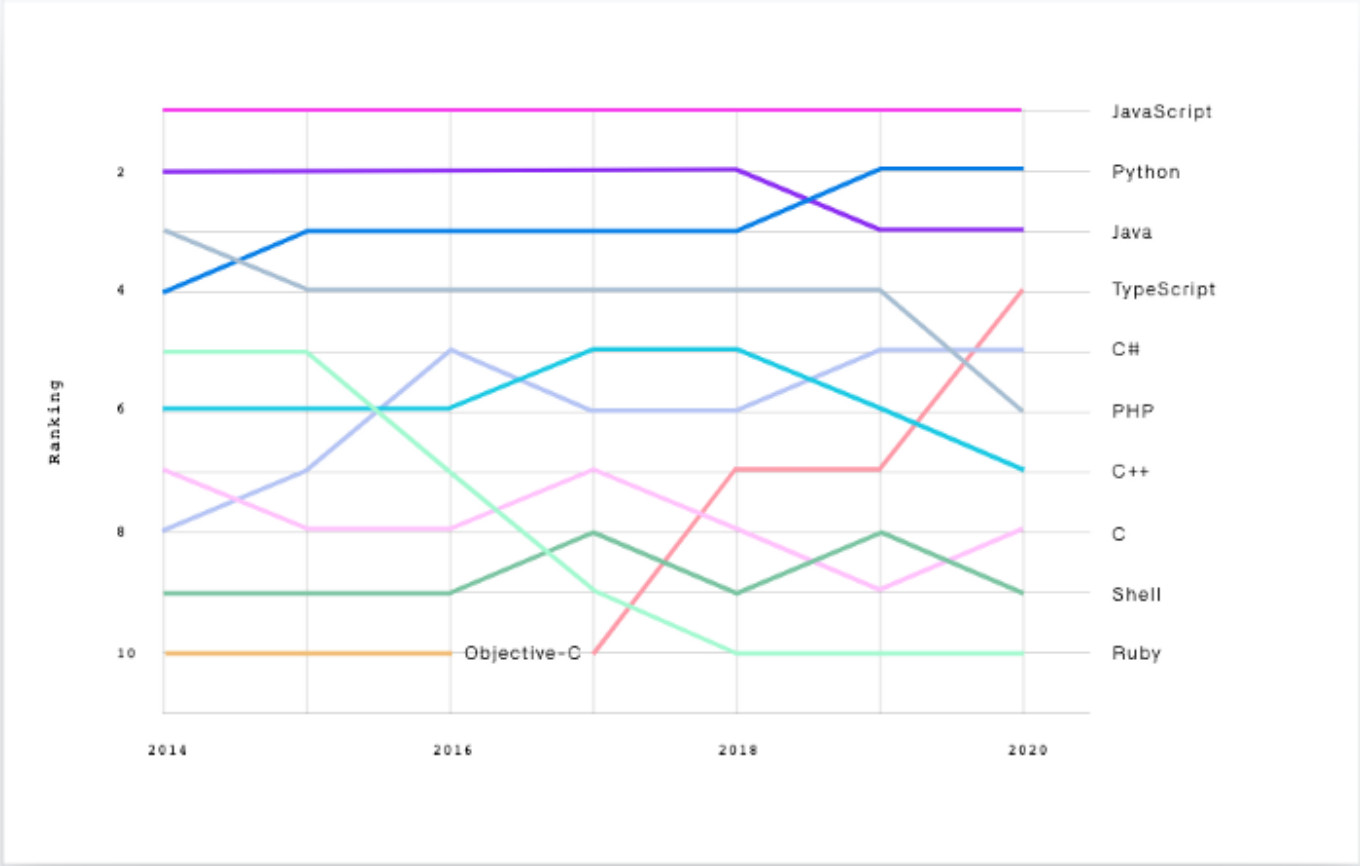
Happy New Year! It's time to review the big trends in JavaScript and technology in 2020 and consider our momentum going into 2021.

Our aim is to highlight the learning topics and technologies with the highest potential job ROI. This is not about which ones are best, but which ones have the most potential to land you (or keep you in) a great job in 2021. We'll also look at some larger tech trends towards the end.

Language Rankings

JavaScript still reigns supreme on GitHub and Stack Overflow. Tip #1: Learn JavaScript, and in particular, learn functional programming in JavaScript. Most of JavaScript's top frameworks, including React, Redux, Lodash, and Ramda, are grounded in functional programming concepts.

TypeScript jumped past PHP, and C# into 4th place, behind only Java, Python, and JavaScript. Python climbed past Java for 2nd place, perhaps on the strength of the rapidly climbing interest in AI and the PyTorch library for GPU-accelerated dynamic, deep neural networks, which makes experimentation with network structures easier and faster.



Source: GitHub State of the Octoverse, 2020

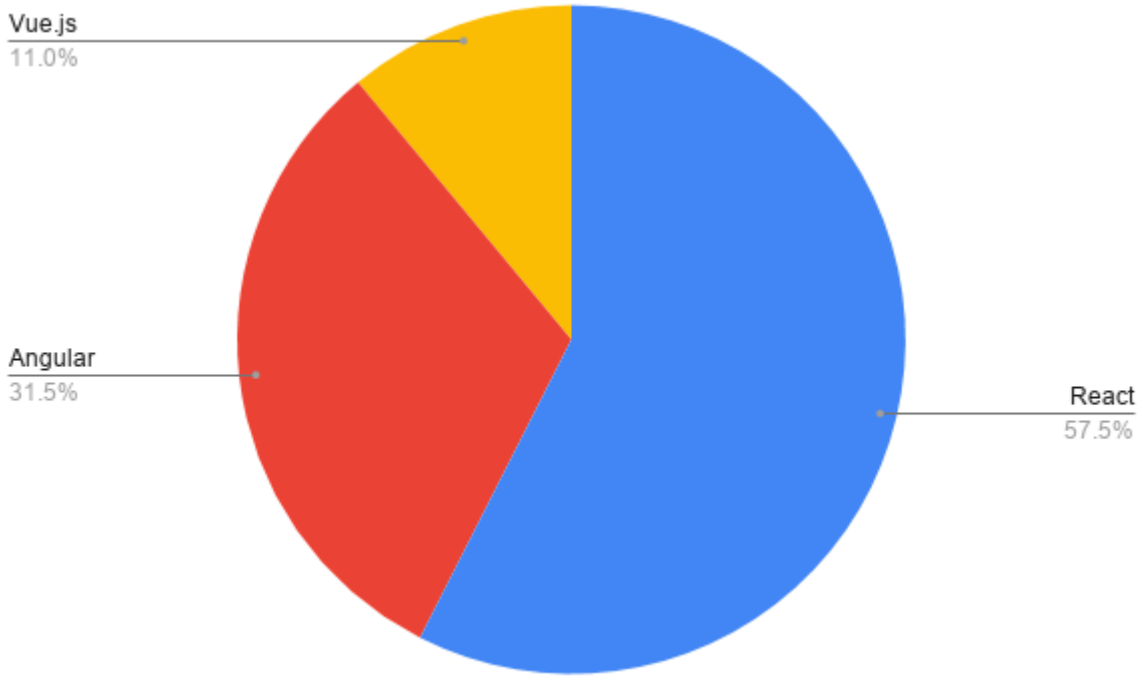
JavaScript is also #1 on Stack Overflow for the 8th year in a row. Python, Java, C#, PHP, and TypeScript beat out languages like C++, C, Go, Kotlin, and Ruby.

Frameworks

When it comes to front-end frameworks, a large majority of JavaScript developers use React, Vue.js, or Angular. jQuery still makes a surprisingly large showing, almost double the Vue.js showings, but it's my guess that jQuery is used less in application work, and more in content sites and WordPress templates, so we're going to exclude it this year.

Search Volume

React dominates search volume at 57.5%, with Angular collecting a large 31.5% share, and Vue.js picking up a respectable 11% slice.

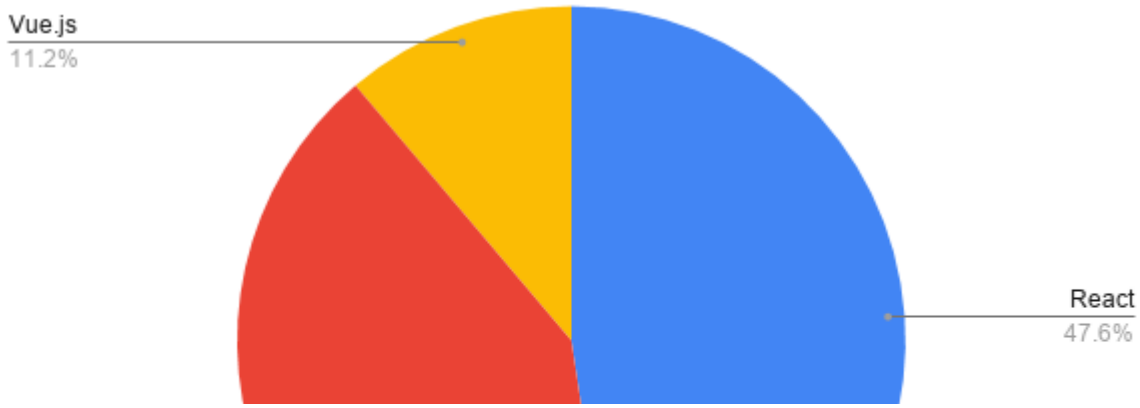


Source: Google Trends

**Methodology:* *All search trends were selected by topic rather than by keyword to exclude false positives.*

Jobs

If you want to learn the framework that will give you the best odds of landing a job in 2021, your best bet is still React, and has been since 2017. React is mentioned in 47.6% of the listings which mention a common front-end framework, Angular picks up 41.2%, and Vue.js trails at 11.2%.

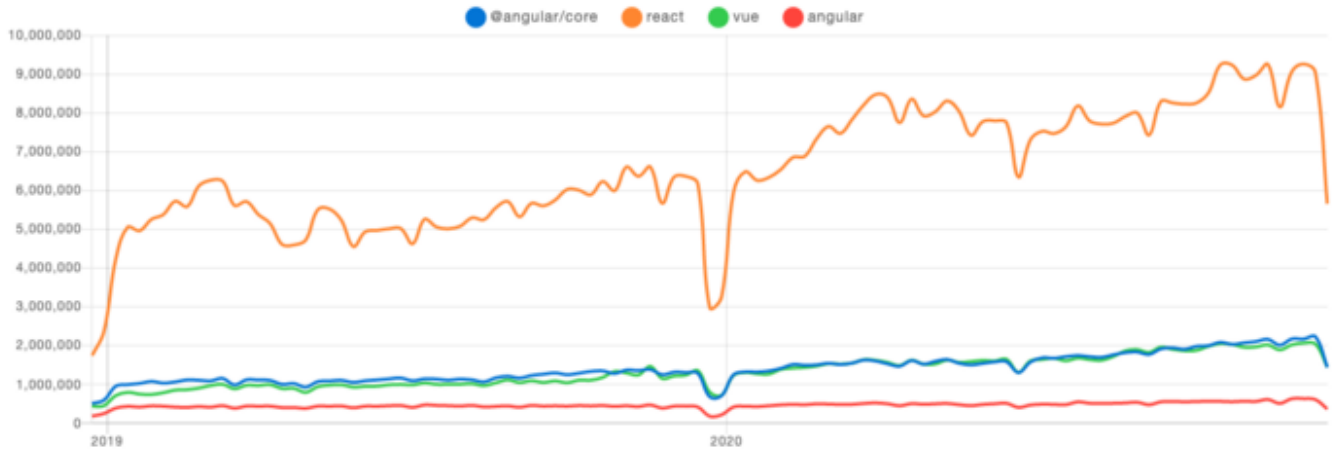


It's important to mention that most job listings say that they require experience with one of a few named frameworks, but *a large share of those listings are actually hiring for React work when you look at their listed tech stack,* and will show preference to candidates with a strong knowledge of React. You'll see some supporting evidence of that in the download trends, below.

**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. I also omitted the ".js" from "Vue.js" because many listings don't include the ".js". All SERPS were sorted by date and spot checked for relevance.*

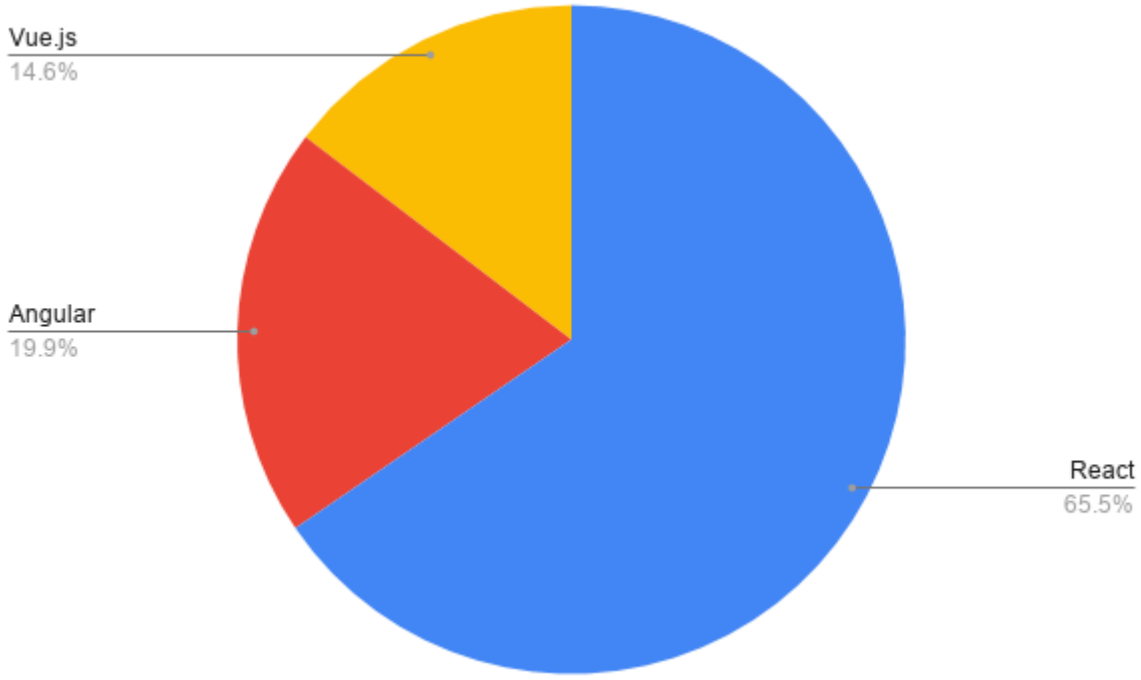
Downloads

The npm download counts look fairly similar to the search trends, but reveal something interesting: The number of downloads for Angular 2+ and Vue.js are pretty much neck-and-neck, but if you add in the number of people using the old Angular framework, Angular has a solid lead over Vue.js in downloads.



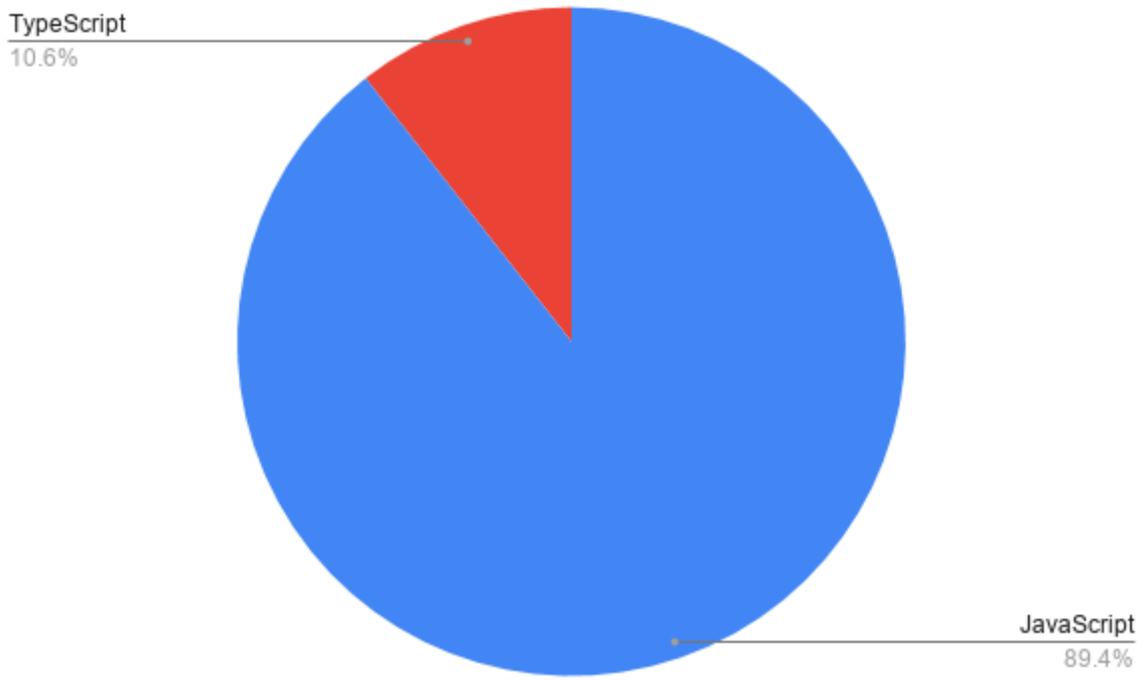
Source: npmtrends.com

If we look at recent download shares on a pie chart, it shows React at ~66%, Angular (all versions) at ~20%, and Vue at ~15%.



TypeScript vs JavaScript

10.6% of employers specifically mention TypeScript in job listings, up from 7.4% last year.



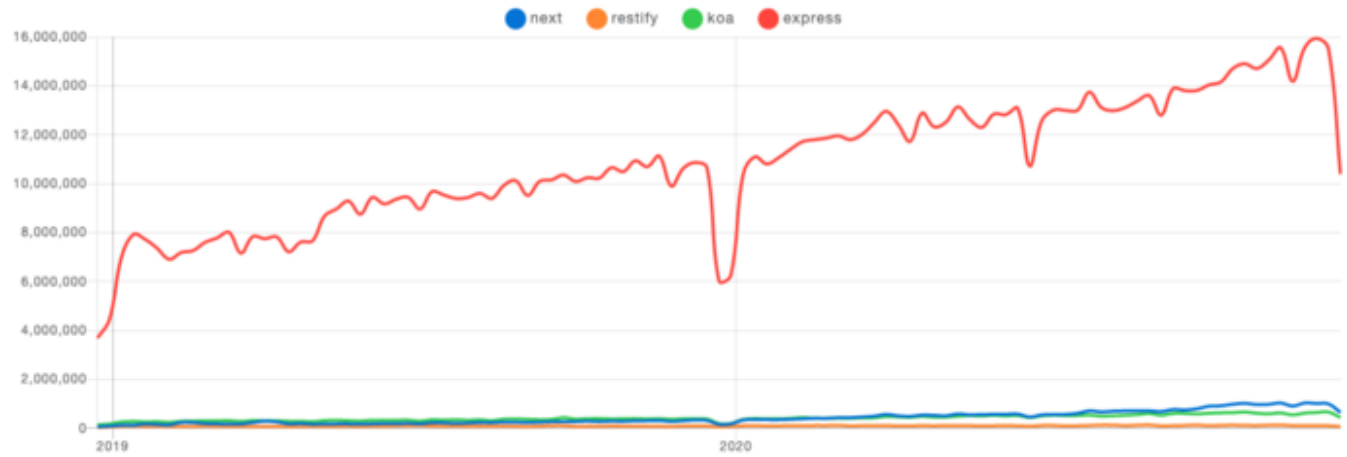
Source: Indeed.com

Developer interest in TypeScript is undeniably strong, and growing rapidly. I predict that this trend will continue in 2021, and users will learn to work around some of the costs of using TypeScript (for example, by favoring interfaces over inline type annotations).

The number of jobs that specifically mention TypeScript is still relatively small, but some experience with TypeScript will slightly increase your odds of landing a job in 2021. By 2022, some experience with TypeScript might give you an edge in the job market. However, because it's easier for a JavaScript developer to learn TypeScript than a completely new language, TypeScript teams are usually willing to hire and train good JavaScript developers.

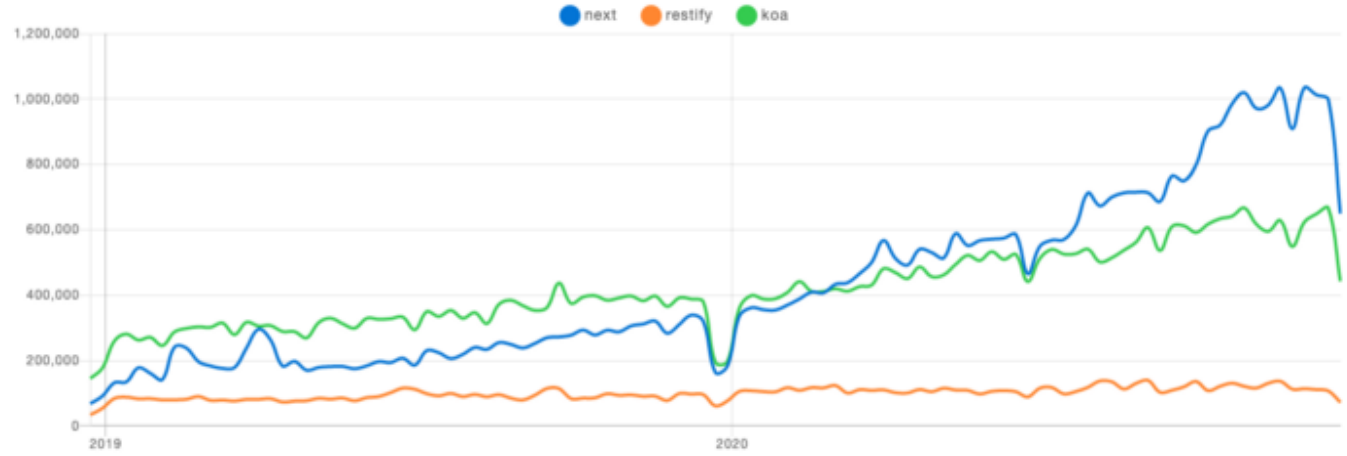
Server Frameworks

On the server side, Express still dominates in download counts, so much so that it's difficult to see how popular contenders are doing relative to each other.



Source: npmtrends.com

As I predicted last year, excluding express, we see that Next.js has emerged as the top contender, which is unsurprising because Next.js is a flexible, full-stack, React-based framework which can help you deliver statically optimized content, but can also fall-back on serverless functions for API routes and SSR when you need to generate content dynamically. You can even statically generate content on-demand the first time it's requested, and subsequently serve cached static content served from CDN — useful for apps based on user-generated content.



Next has many other advantages, including automatic optimization of page bundles, automatic image optimization with the new Image tag and built-in performance analytics to help you improve your user's page load experience.

If you use GitHub and deploy on Vercel, you'll also get automatic deploys for every PR, and a buttery smooth CI/CD pipeline. Essentially, it's like having the best full-time DevOps team on staff, but instead of paying them salaries, you save a significant amount of money in hosting bills.

Expect Next.js to continue to explode in 2021.

Remote Work Trends

In 2020, teams were forced to learn to collaborate remotely by a global pandemic. In 2021, remote work will continue to be an important topic. First, because it will probably be June before vaccination against COVID-19 is widespread, and second, because a lot of teams experienced increased productivity and reduced costs during lockdown, many employees will not return to offices in 2021.

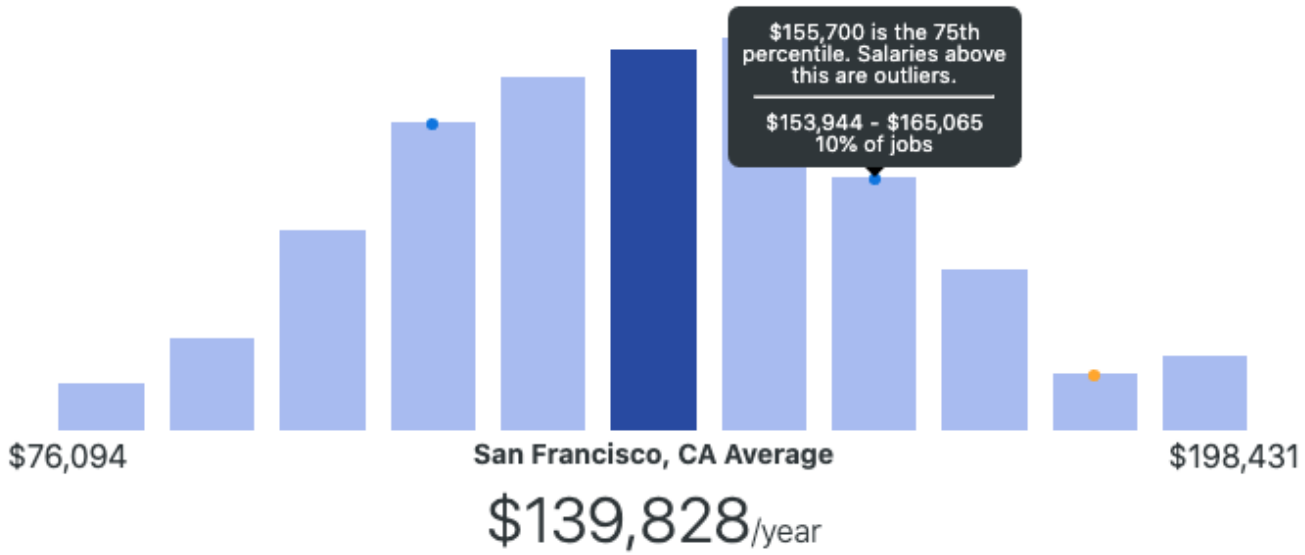
Remote work has also led to more location freedom, prompting developers to move to places where they have access to things that are important to them, such as family and more affordable housing. Additionally, 72% of employers surveyed by KPMG said that remote work has widened their potential talent pool.

> Remote-first and hybrid-remote teams will be the new normal in the new decade.

Average JavaScript Developer salaries dipped slightly in 2020, from $114k/year to $113k/year, according to Indeed, perhaps due in part to remote work expanding the employee pool beyond tech centers like San Francisco and New York, which tend to have a much higher cost of living, and demand higher salaries to compensate. The average JavaScript Developer salary in San Francisco is $130k.

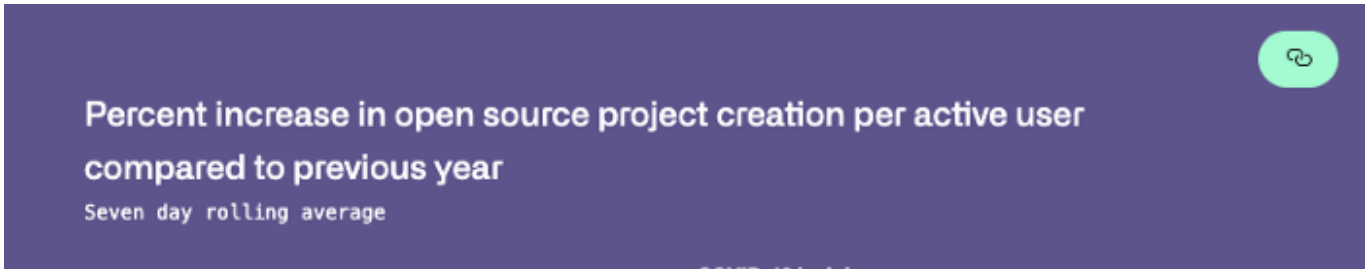
Still, lots of companies with roots in San Francisco and other tech centers are paying remote workers somewhere between the US national average and San Francisco pay, which provides a premium on market rates to attract better talent, and still saves money over hiring locally and paying for office space.

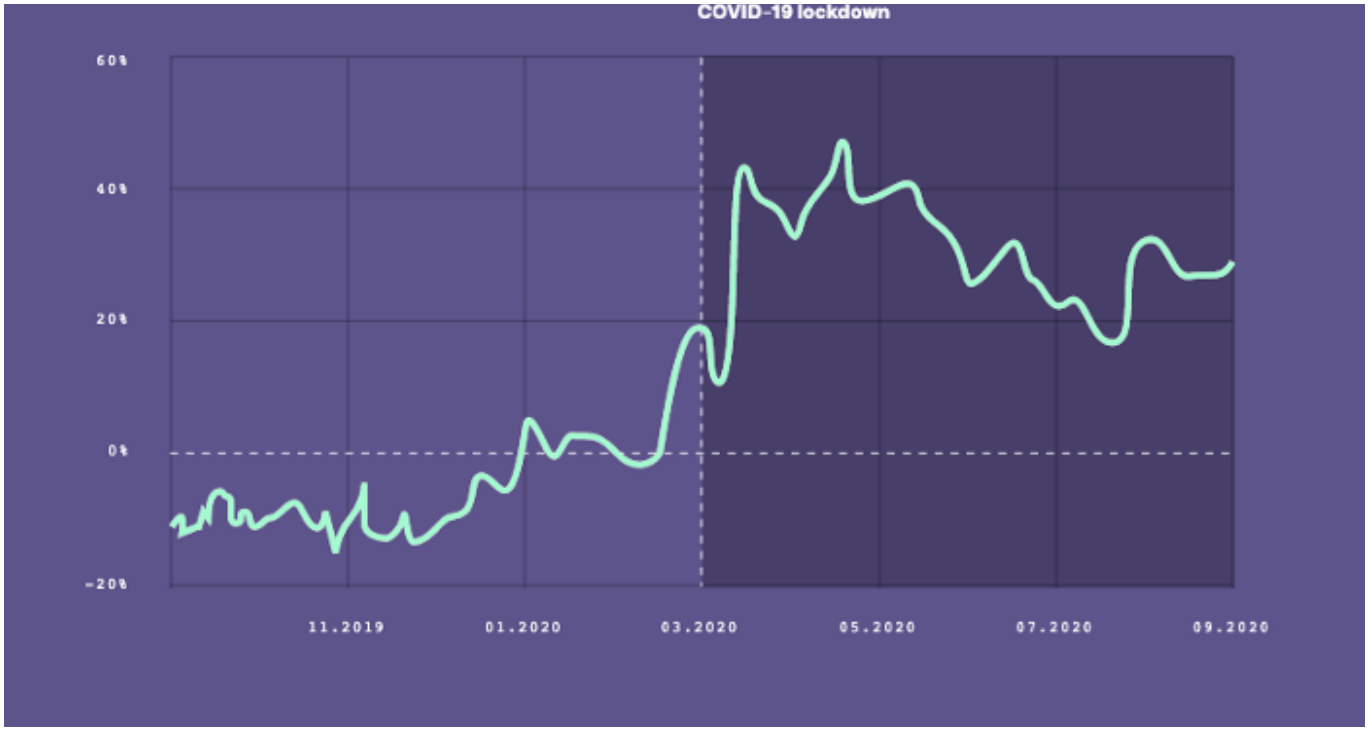
Because of this trend, lots of remote jobs exist in the $115k — $130k range for mid-level developers. Senior developers often find jobs in the $120k — $150k range, *regardless of location.*



Source: ZipRecruiter

GitHub data suggests that rather than slowing down, teams were more productive working remotely in 2020. GitHub activity spiked when lockdowns began.





Source: GitHub State of the Octoverse, 2020

Volume of work on GitHub increased substantially, and average pull request merge times dropped by 7.5 hours.

Toss that onto the growing pile of evidence that *remote work works.*

Passwords are Obsolete

Passwords are obsolete, insecure technology and absolutely should not be used to protect your users or your app in 2021.

The crux of the matter is that about half of all users reuse passwords on multiple applications and websites, and attackers are financially incentivized to bring massive computing power to the problem of cracking your user's passwords so they can try them on bank accounts, Amazon, etc.

If you're not Google, Microsoft, or Amazon, chances are you can't afford the computing power required to defend against modern password crackers. Don't believe me? Check out HaveIBeenPwned. Spoiler: If you've used the internet, your passwords have been stolen.

I've been warning about the dangers of passwords for years, but in 2020, new options emerged which allow us to leave passwords behind, permanently. It was true in 2020,

and it remains true: No new app should use passwords in 2021.

But once you leave passwords behind in exchange for cryptographic key pairs, your app also gains Web3 superpowers. Which leads me to the next topic: Crypto.

Crypto

Crypto will continue to be one of the most important and globally transformational technologies in 2021. Here are some highlights from 2020:

- **Bitcoin exploded** to new all time highs, thanks in part to notable support from companies like PayPal. Expect more of the same in 2021.
- **Ethereum 2.0 beacon chain launched,** which lays the groundwork for Ethereum to become a much more scalable platform. Additionally, scalability solutions such as side-chains and zkRollups gained momentum in 2020. Expect to see more DApps (Decentralized Apps) integrate those scaling solutions in 2021.
- **DeFi (Decentralized Finanance) is now a $15 billion market** (up from $650 million when I wrote last year's edition of this post), mostly operating on the Ethereum blockchain. Many multi-million-dollar exploits plagued the DeFi ecosystem in 2020. Smart contract security will continue to be a hot topic and huge opportunity in 2021.
- **Non-Fungible Tokens (NFTs) gained momentum** in 2020, with several high profile sales of single tokens priced in the tens of thousands of dollars, each. Rarible introduced their own community token and began to airdrop it to marketplace users, fueling increased volume. Millions of dollar's worth of NFTs are bought and sold daily, but this is just the beginning. Because they can represent virtually anything of value, the total addressable market is in the $trillions.
- **The Flow blockchain launched** and brought with it lots of promise for mainstream blockchain adoption. **NBA Top Shot has sold over $6 million** in NBA-branded NFT moments, which represent short video clips of key moments in NBA games.
- **Theta Network launched smart contracts and NFTs.** Among other things, NFTs will be used for stickers and badges on Theta.tv, a decentralized alternative to Twitch with millions of monthly active users.

Artificial Intelligence (AI)

2020 was a seminal year for AI. Via the GPT-3 launch, we learned that language models and transformers in general may be a viable path towards Artificial General Intelligence (AGI).

The human mind's ability to generally solve a wide variety of problems by relating them to things we already know is known in AI circles as zero-shot and few-shot learning. We don't need a lot of instruction or examples to take on tasks that are new to us. We can often figure out new kinds of problems with just a few (or no) examples (shots).

That general applicability of human cognitive skills is known as general intelligence. In AI, Artificial General Intelligence (AGI) is "the hypothetical intelligence of a machine that has the capacity to understand or learn any intellectual task that a human being can."

GPT-3 demonstrated that it could teach itself math, how to code, how to translate text, and a virtually infinite variety of other skills via its gigantic training set which includes basically the whole public web (Common Crawl, WebText2, Books1, Books2, and Wikipedia), combined with its enormous model size. GPT-3 uses 175 billion parameters. For context, that's an order of magnitude (10x) the previous state of the art, but still orders of magnitude smaller than the human brain.

Scaling up GPT-3 is likely to lead to even more breakthroughs in what it is capable of.

Self Driving Cars

In October 2020, Waymo began offering fully driverless rides (with no human in the driver seat) on 100% of their rides. At the time of launch, there were 1500 monthly active users and hundreds of cars serving the Phoenix metro area.

In December, 2020, General Motors' Cruise launched fully driverless rides on the streets of San Francisco.

Drone Delivery

UPS launched 2 drone trials in 2020. One to deliver prescriptions to a retirement community in Florida, and another to deliver medical supplies including Personal Protective Equipment (PPE) between health care facilities in North Carolina.

Regulations, safety, noise, and technical challenges will likely continue to mean slow growth for Drone delivery services in 2021, but with continued COVID restrictions that will likely continue off and on through at least June, there has never been a better time to make quick progress on more efficient and contactless delivery.

Quantum Computing

Researchers in China have reported that they have achieved quantum supremacy that is 10 billion times faster than the quantum supremacy reported by Google last year. Researchers are making rapid progress, but quantum computing still requires extremely expensive hardware, and there are only a small handful of quantum computers in the world that have achieved any kind of quantum superiority.

Quantum-resistant cryptography, quantum-assisted cryptography, and quantum computing for machine learning are potential areas of focus where breakthroughs would have a significant industry-spanning, global impact. I believe that one day, the application of quantum computing in the field of AI will propel the technology forward many orders of magnitude — a feat that will have a profound impact on the human race.

In my opinion, that is unlikely to happen in the 2020s, but I expect to hear more quantum supremacy announcements in 2021, and perhaps breakthroughs in the variety

of algorithms state of the art quantum computers can compute. We may also see more practical quantum-computing APIs services and use-cases.

Next Steps

Composing Software will teach you the foundations of functional programming in JavaScript. You can get the Composing Software e-book, print edition, or the blog post series that started it all.

Learn React, Redux, Next.js, TDD and more on EricElliottJS.com. Access a treasure trove of video lessons and interactive code exercises for members.

1:1 Mentorship is hands down, the best way to learn software development. DevAnywhere.io provides lessons on functional programming, React, Redux, and more, guided by an experienced mentor using detailed curriculum designed by Eric Elliott.

Eric Elliott *is a tech product and platform advisor, author of "Composing Software", cofounder of EricElliottJS.com and DevAnywhere.io, and dev team mentor. 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.*

He enjoys a remote lifestyle with the most beautiful woman in the world.

Thanks to JS_Cheerleader.

JavaScript Technology AI Crypto Software Development