

tools.js



@ronnieoverby

Where We Were (or still are)

- Javascript ran only in the browser
- Implicit dependencies
- js reference order mattered

```
27      <!-- libs -->
28      <script src="js/libs/babel-polyfill.js"></script>
29      <script src="js/libs/wu.js"></script>
30      <script src="js/libs/bignumber.js"></script>
31      <script src="js/jquery/jquery.min.js"></script>
32      <script src="js/libs/jquery.signalR.js"></script>
33      <script src="js/libs/lodash.js"></script>
34      <script src="js/lodash_mixins.js"></script>
35      <script src="js/libs/moment.min.js"></script>
36      <script src="js/libs/pdf.combined.js"></script>
37      <script src="js/libs/filesaver.js"></script>
38      <script src="js/app/private.js"></script>
39      <script src="js/app/utils.js"></script>
40
41      <!--models-->
42      <script src="js/app/models/BusinessDay.js"></script>
43      <script src="js/app/models/Batch.js"></script>
44      <script src="js/app/models/BatchItem.js"></script>
45      <script src="js/app/models/FraudResults.js"></script>
46      <script src="js/app/models/TrueChecksResult.js"></script>
47      <script src="js/app/models/ECL.js"></script>
```



```
49  <!-- Angular -->
50  <script src="js/libs/angular/angular.js"></script>
51  <script src="js/libs/angular-drag-and-drop-lists.js"></script>
52  <script src="js/libs/angular/hotkeys.js"></script>
53  <script src="js/libs/angular/angular-cookies.js"></script>
54  <script src="js/libs/angular/angular-animate.js"></script>
55  <script src="js/libs/angular/angular-resource.js"></script>
56  <script src="js/libs/angular/angular-messages.js"></script>
57  <script src="js/libs/angular/angular-ui-router.js"></script>
58  <script src="js/libs/angular/ui-jq.js"></script>
59  <script src="js/libs/angular/ui-event.js"></script>
60  <script src="js/libs/angular/ui-validate.js"></script>
61  <script src="js/libs/angular/ocLazyLoad.js"></script>
62  <script src="js/libs/angular/ui-bootstraptpls.js"></script>
63  <script src="js/app/ui-bootstrap-tpl-overrides.js"></script>
64  <script src="js/angular/angular-translate.js"></script>
65  <script src="js/angular/ui-jq.js"></script>
66  <script src="js/angular/ui-load.js"></script>
67  <script src="js/angular/ui-validate.js"></script>
68  <script src="js/libs/angular/angular-cookie.js"></script>
69  <script src="js/libs/angular/angular-sanitize.js"></script>
70  <script src="js/libs/angular/dialogs.min.js"></script>
71  <script src="js/modules/toaster/toaster.js"></script>
72  <script src="js/libs/angular/ng-currency.js"></script>
73  <script src="js/libs/angular/angular-busy.js"></script>
74  <script src="js/libs/angular/angular-pdf-viewer.js"></script>
75
```

```
76      <!-- App (THEME STUFF TODO REMOVE LATER) -->
77      <script src="js/app.js"></script>
78      <script src="js/services.js"></script>
79      <script src="js/controllers.js"></script>
80      <script src="js/filters.js"></script>
81      <script src="js/directives.js"></script>
82      <script src="js/modules/toaster/ctrl.js"></script>
83
84      <!--services-->
85      <script src="js/app/services/SignalRConfig.js"></script>
86      <script src="js/app/services/HubFactory.js"></script>
87      <script src="js/app/services/storage.js"></script>
88      <script src="js/app/services/AuthService.js"></script>
89      <script src="js/app/services/StateService.js"></script>
90      <script src="js/app/admin/UserService.js"></script>
91      <script src="js/app/search/SearchService.js"></script>
92      <script src="js/app/user/CurrentUserService.js"></script>
93      <script src="js/app/services/busDayService.js"></script>
94      <script src="js/app/Batches/scanner.js"></script>
95      <script src="js/app/Batches/batchService.js"></script>
96      <script src="js/app/services/Urls.js"></script>
97      <script src="js/app/admin/settingsService.js"></script>
98      <script src="js/app/services/setupService.js"></script>
99      <script src="js/app/admin/maintenanceService.js"></script>
100     <script src="js/app/reporting/ReportingService.js"></script>
101     <script src="js/app/services/Heartbeat.js"></script>
102     <script src="js/app/services/PrinterService.js"></script>
103     <script src="js/app/services/NavHelper.js"></script>
104
```

```
105      <!--controllers-->
106      <script src="js/app/admin/DestinationsController.js"></script>
107      <script src="js/app/admin/AppSettingsController.js"></script>
108      <script src="js/app/admin/MaintenanceController.js"></script>
109      <script src="js/app/admin/UsersController.js"></script>
110      <script src="js/app/admin/UserController.js"></script>
111      <script src="js/app/search/BatchItemsController.js"></script>
112      <script src="js/app/search/BatchItemController.js"></script>
113      <script src="js/app/search/SearchController.js"></script>
114      <script src="js/app/search/BatchSearchController.js"></script>
115      <script src="js/app/search/ItemSearchController.js"></script>
116      <script src="js/app/search/BatchSearchResultsController.js"></script>
117      <script src="js/app/search/ItemSearchResultsController.js"></script>
118      <script src="js/app/ForgotPasswordController.js"></script>
119      <script src="js/app/ResetPasswordController.js"></script>
120      <script src="js/app/user/CurrentUserController.js"></script>
121      <script src="js/app/admin/BusinessDayController.js"></script>
122      <script src="js/app/dashboard/DashboardBusDayController.js"></script>
123      <script src="js/app/Batches/BatchesController.js"></script>
124      <script src="js/app/Batches/BatchController.js"></script>
125      <script src="js/app/Setup/SetupController.js"></script>
126
127      <script src="js/app/reporting/ReportingController.js"></script>
128      <script src="js/app/reporting/AuditReportController.js"></script>
129      <script src="js/app/ecl/EclsController.js"></script>
130
```

```
132  <!--directives-->
133  <script src="js/app/directives/peekPassword.js"></script>
134  <script src="js/app/directives/Pagination.js"></script>
135  <script src="js/app/directives/Sort.js"></script>
136  <script src="js/app/directives/flipCal.js"></script>
137  <script src="js/app/directives/imgFlip.js"></script>
138  <script src="js/app/directives/gravatar.js"></script>
139  <script src="js/app/directives>ShowTemplate.js"></script>
140  <script src="js/app/directives/focusOn.js"></script>
141  <script src="js/app/directives/errSrc.js"></script>
142  <script src="js/app/validators/CheckFieldValidator.js"></script>
143
144  <!--filters-->
145  <script src="js/app/filters/CommaDelimitedFilter.js"></script>
146
147  <script src="js/app/HeaderController.js"></script>
148  <script src="js/app/services/headerService.js"><
```



IT'S BEEN A RUFF DAY

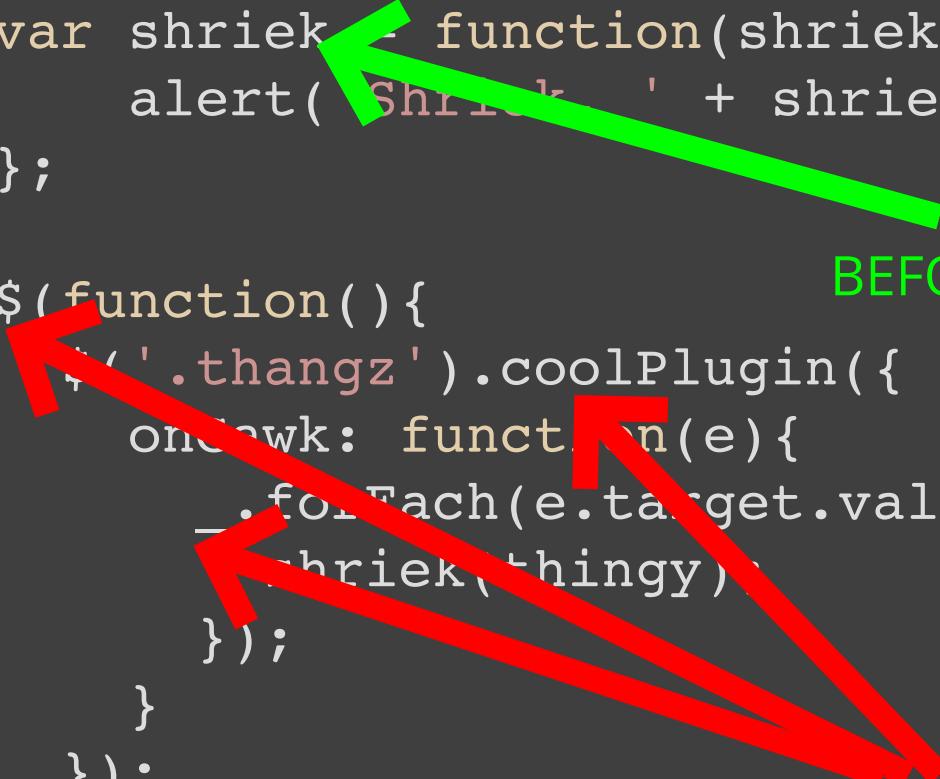
Implicit Dependency

```
var shriek = function(shrikee) {
  alert('Shriek ' + shrikee + ' !');
};

$(function() {
  $('.thangz').coolPlugin({
    onCawk: function(e) {
      e.forEach(e.target.values, function(thingy) {
        shriek(thingy);
      });
    }
  });
}) ;
```

THIS MUST BE EVAL'D
BEFORE OTHERS CAN USE!!!

THESE MUST BE DEFINED BY NOW!!!



Where We Want To Be

- Single .js reference (or as few as possible)
- Explicitly declared dependencies
 - ... easy to find and understand
- Order doesn't matter
 - ... because there's not much to order

ES2015 Modules

```
import _ from 'lodash';
import $ from 'jquery';
import coolPlugin from 'that-cool-jq-plugin';

const shriek = shriekee =>
  alert(`Shriek, ${shriekee}!`);

$('.thangz').coolPlugin({
  onGawk: function(e){
    _.forEach(e.target.values, function(thingy){
      shriek(thingy);
    });
  }
});

export {shriek};
```

```
<script src="app.js"></script>
```



How Can We Get There?

- Just Use ES6?
 - Javascript can now run **everywhere**
 - Client/Browser
 - Server
 - Dev. / Build Environments
 - ... but not the **SAME** everywhere

We Need Tools!

1. ES2015+ Transpiler
2. Build Tool
3. Package Manager
4. Nice To Haves
 - Linters
 - Static Analyzers
 - Test Runners
 - Watchers

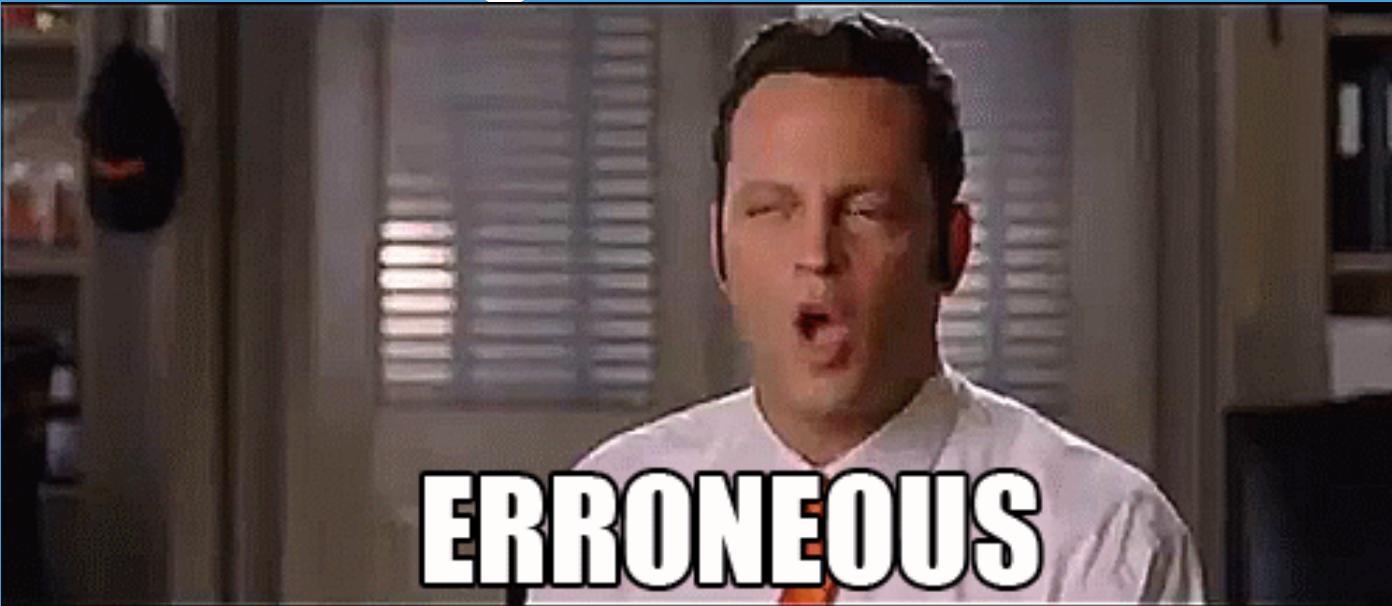


Let's Get Tools!

Ronnie Overby's Fallacies of JS Tool Selection



1. Choosing tools is easy!
2. Learning to use the



won't need or want to
switch!

There Are Too Many Overlapping Choices



For front-end
Jam is
Unlike other



The Most C
Yo

Build rich

Fricio



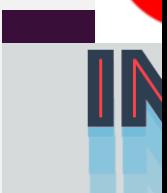
the las

TC

What is

Traceur is a

5



Immutable collections for JavaScript

A JAVASCRIPT LIBRARY FOR BUILD

A Javascript Framework for Building Brilliant Applications

Too Many Choices

leads to...



Picking The Wrong Tool

A man with brown hair, wearing a red blazer over a white shirt and a blue striped tie, looks shocked or confused. Three arrows point from text labels on the left to him: a green arrow from 'Knowable after observing failure', an orange arrow from 'Knowable after it's too late', and a red arrow from 'Completely Unpredictable'.

Did you know...

- Breeze.js is precluded by binding frameworks that monkey patch getters/setters?
- Angular 1.x has a completely irrelevant and mostly useless module system?
- Bower would fall far out of favor for front-end package management?

Knowable after observing failure

Knowable after it's too late

Completely Unpredictable

I immediately regret this decision

Fear of poor choice



leads to...

Analysis Paralysis

- Babel vs Traceur vs TypeScript vs CoffeeScript
- Angular vs Ember vs Durandal vs Aurelia vs React vs Vue vs Riot vs Mithril vs Backbone vs Meteor vs Sails
- Grunt vs Gulp vs Brunch vs Broccoli vs Browserify vs WebPack vs jspm vs Duo vs Gobble vs RequireJS vs Rollup vs Sprockets vs Fly vs Start
- Jasmine vs Jest vs Karma vs Mocha vs QUnit

Decision Making

- Gauge Project Health
 - Github Stats API
- Gauge Community Interest
 - StackOverflow Data Explorer
- Keep your ear to the ground
 - Podcasts
 - Meetups
 - Google
 - "whizbang.js sucks"
 - "whizbang.js is awesome"
 - "whizbang.js vs goatmilk.js"

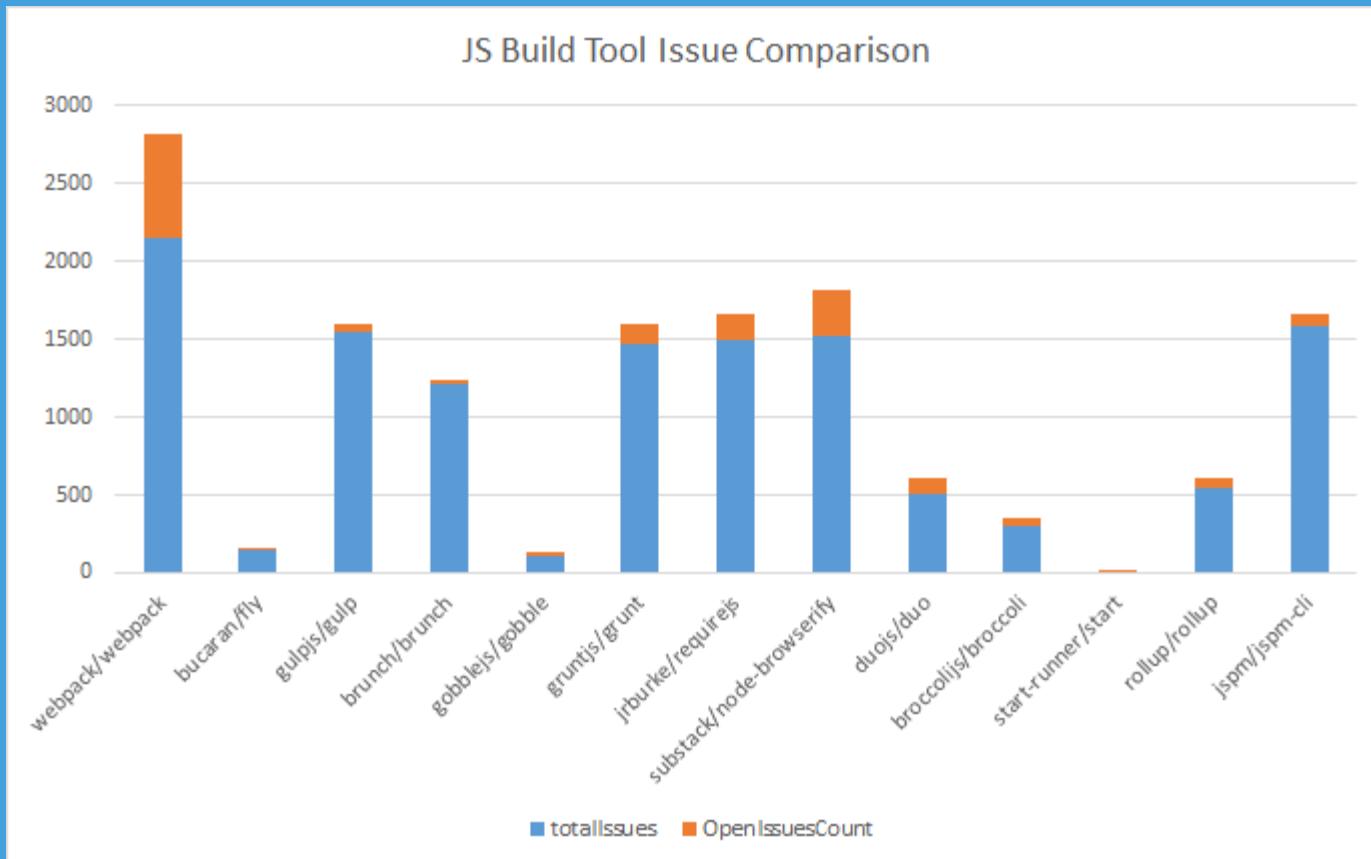


Repo/Stats API

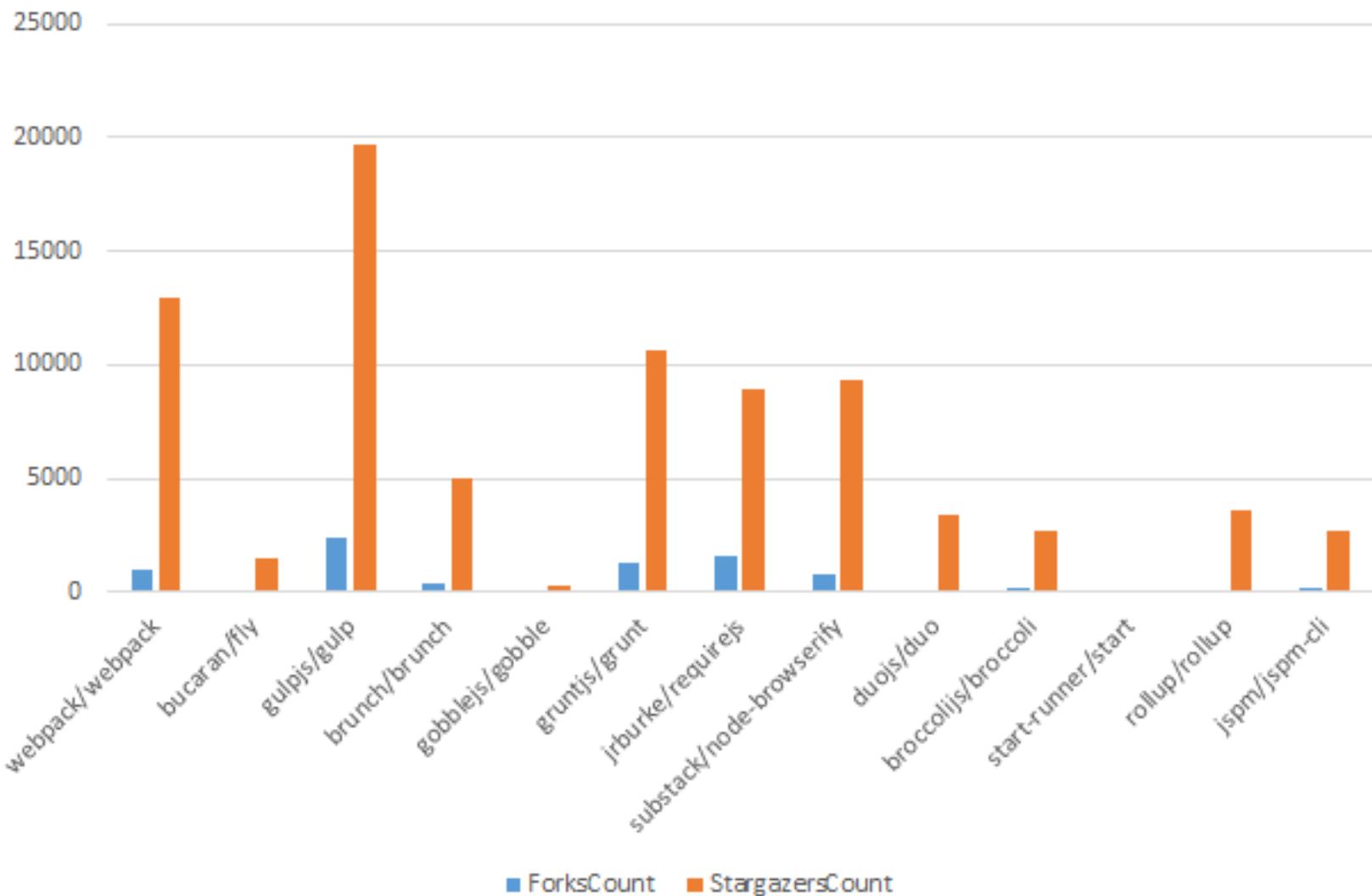
<https://developer.github.com/v3>



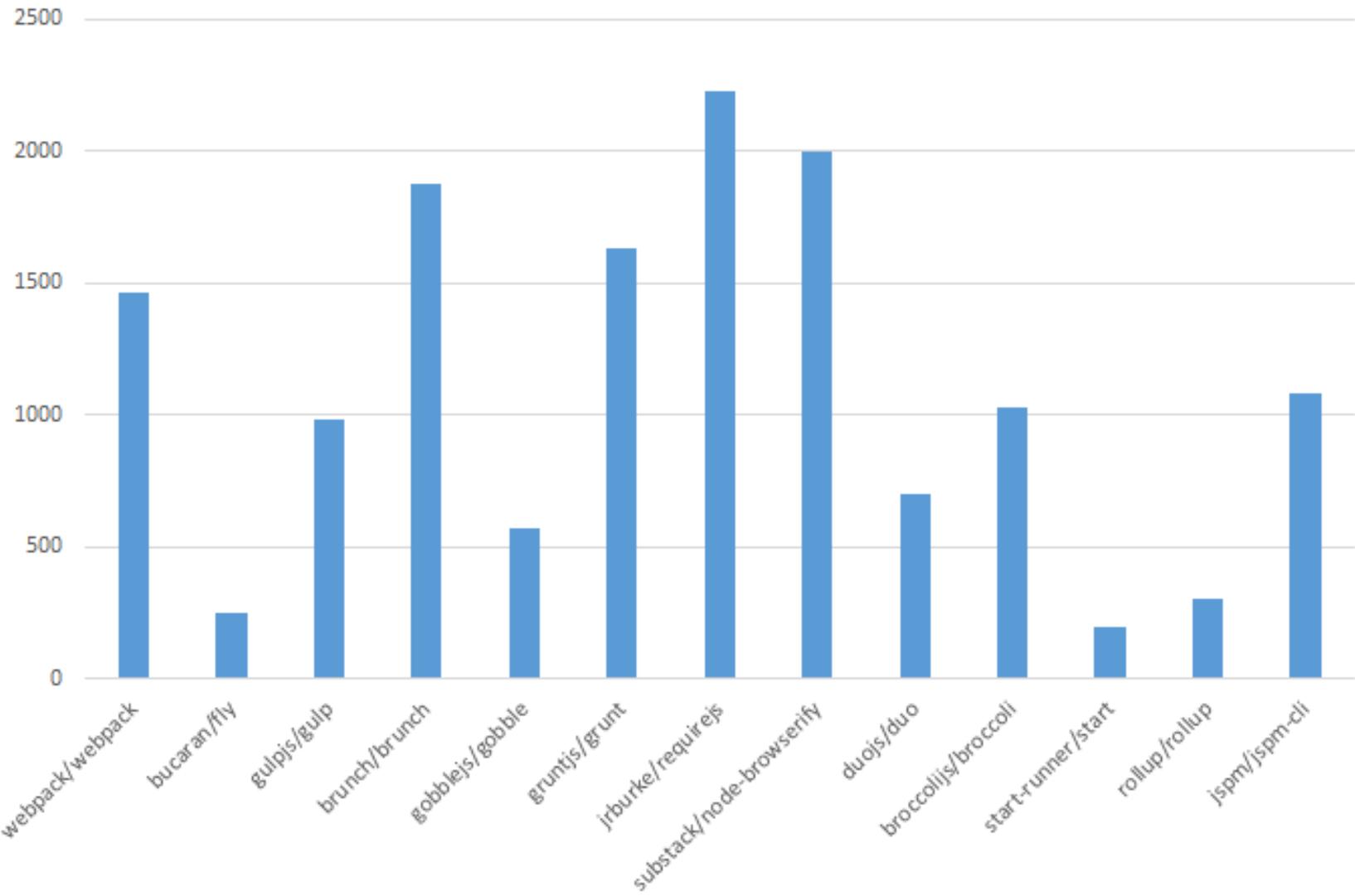
<https://github.com/octokit>



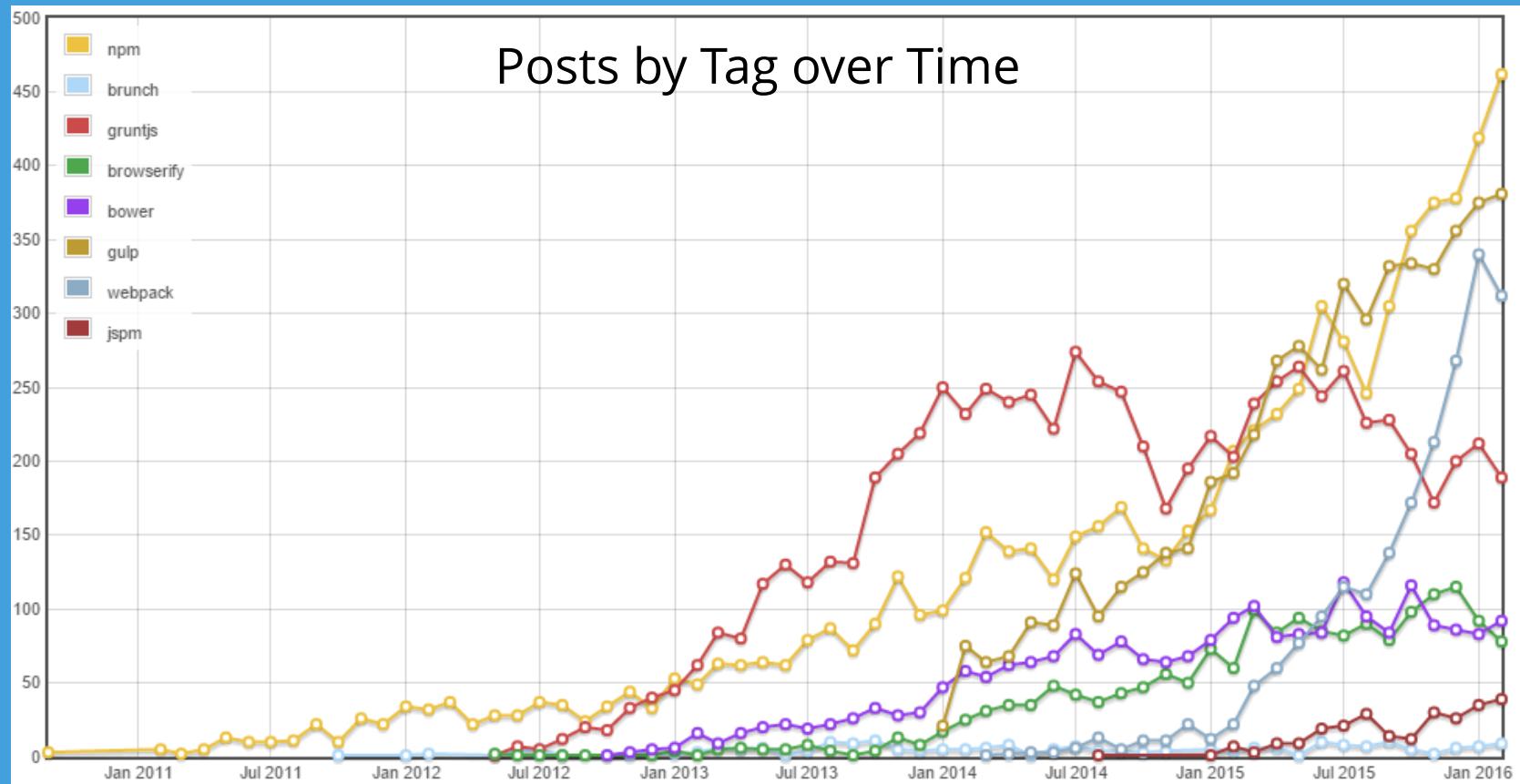
JS Build Tool Github Community Activity



JS Build Tools Ages (days)



Data Explorer



Back to the point

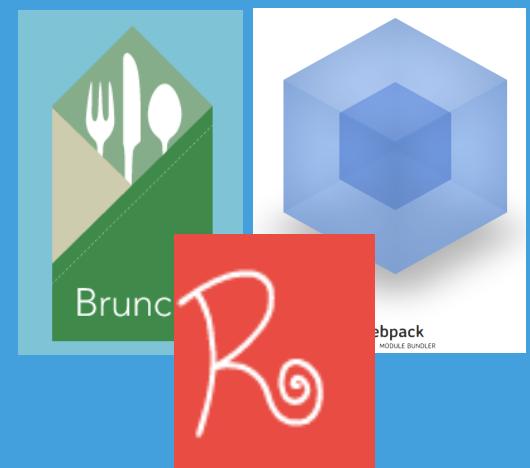
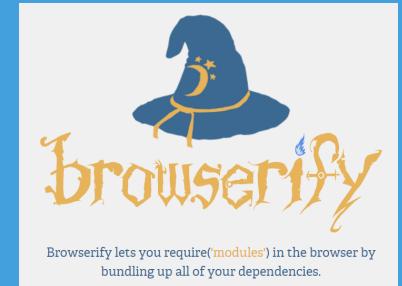
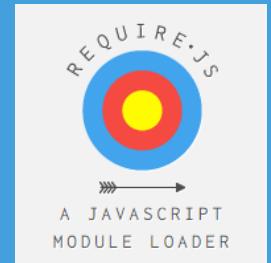
- We want to catch up to modern JS practices in the browser
- Browsers are notoriously inconsistent
- There are many tools to choose from to help us
- Specifically, we want...
 - to write modular code
 - to use the latest language constructs
 - to easily import and use dependencies
 - smaller and fewer build outputs
 - TO WORK ON THE APP!
 - NOT THE TOOLS!!!

FULL DISCLOSURE

I DON'T KNOW EVERYTHING

Modules @ Browser

- Require.js
 - AMD, Older, Messy Setup
- Browserify
 - CommonJS, Popular
- Webpack
 - Many module types, harder to use, Popular
- System.js
 - Many module types
- Brunch
 - CommonJS, plugins
- Rollup
 - Newer, Tree Shaking



Build

- Grunt
 - Tasks, Seems in decline, older, slower, verbose configuration
- Gulp
 - Tasks, Streaming, meteoric popularity rise
- Brunch
 - Declarative config, fast incremental builds. App skeletons
- Broccoli
 - Asset pipeline, fast increment builds, not popular



Transpile

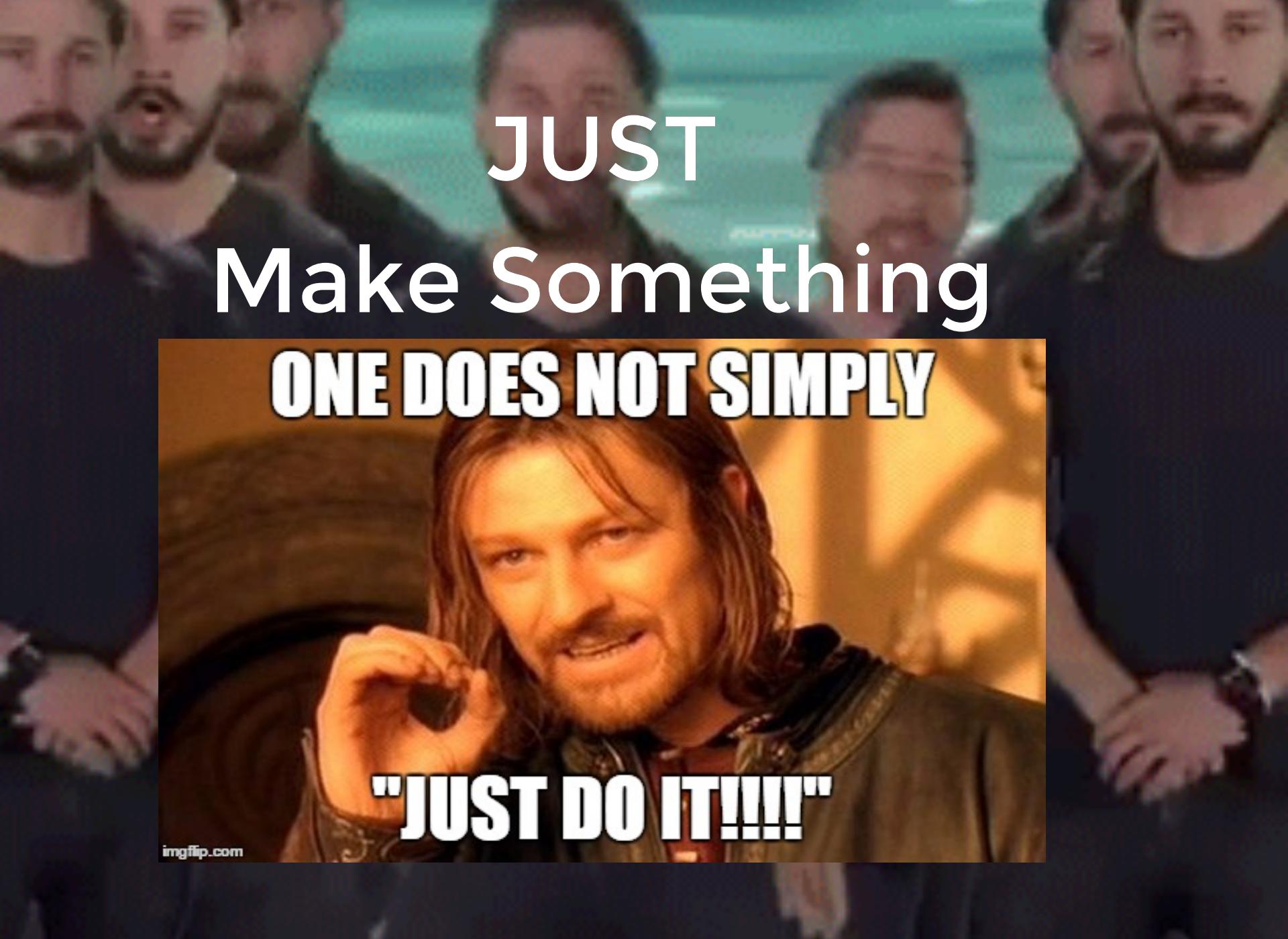
- CoffeeScript
 - Not JS, Older, ruby influenced, declining
- TypeScript
 - Type safety, JS superset, type def files, JSX
- Babel
 - JS! Modular, JSX, Readable output
- Traceur
 - JS! Requires runtime
- LiveScript
 - Descended from CoffeeScript
- Elm
 - Holistic, functional



Package Management

- NPM
 - You must be using this! Rising in popularity for non-node packages
- Bower
 - Focused on front-end. In decline
- jspm
 - NPM and Github as registries. Tied @ hip to system.js
- Jam
 - eh. who cares...





JUST
Make Something
ONE DOES NOT SIMPLY

"JUST DO IT!!!!"

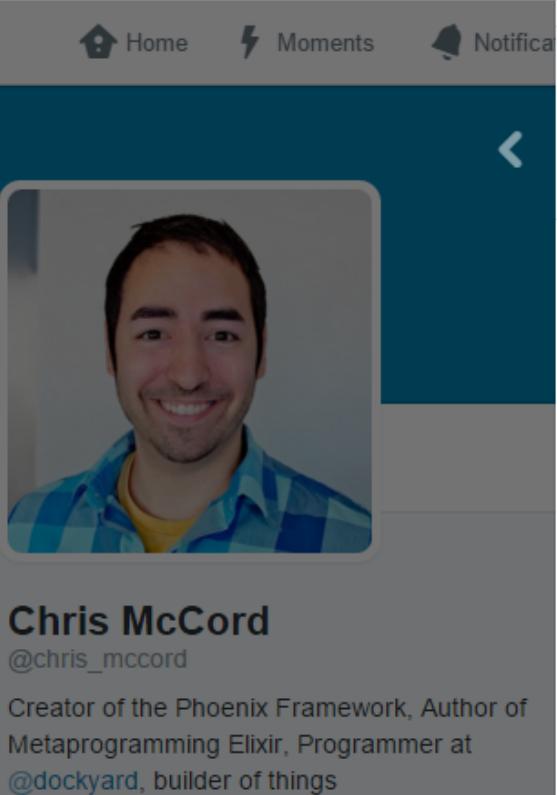
Brunch

<http://brunch.io>

- NPM Friendly
- Module Wrapping
- CLI
- Compile Steps
- Plugins
- Watches File System
- Incremental Builds
- Source Mapping
- Production Builds
- Concats/Minifies
- Images/CSS/JS/Static Assets



https://twitter.com/chris_mccord/status/569551255498063872



Chris McCord
@chris_mccord
Creator of the Phoenix Framework, Author of Metaprogramming Elixir, Programmer at @dockyard, builder of things

Michael Jackson @mjackson · 22 Feb 2015
@chris_mccord Congrats :) Looks like webpack didn't work well for you?
@brunch

Chris McCord
@chris_mccord

@mjackson @brunch webpack was a very close 2nd. For general use, I think users will find brunch easier, especially around vendor'd assets

12:36 PM · 22 Feb 2015