INFINUM

Always look on the evergreen side of life

DARKO KUKOVEC

“MODERN” WEB DEVELOPMENT

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1. Create a folder

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2. git init

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5. Set up gulp, webpack, SASS, Babel, …

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5. Set up gulp, webpack, SASS, Babel, …
6. …

“MODERN” WEB DEVELOPMENT

1. Create a folder
2. git init
3. npm init
4. npm install the-whole-web
5. Set up gulp, webpack, SASS, Babel, …
6. …
7. Start developing

WHY?

- Apps getting more complex
- Frameworks
- Getting bigger
- New browser APIs

THE PROBLEM

THE PROBLEM

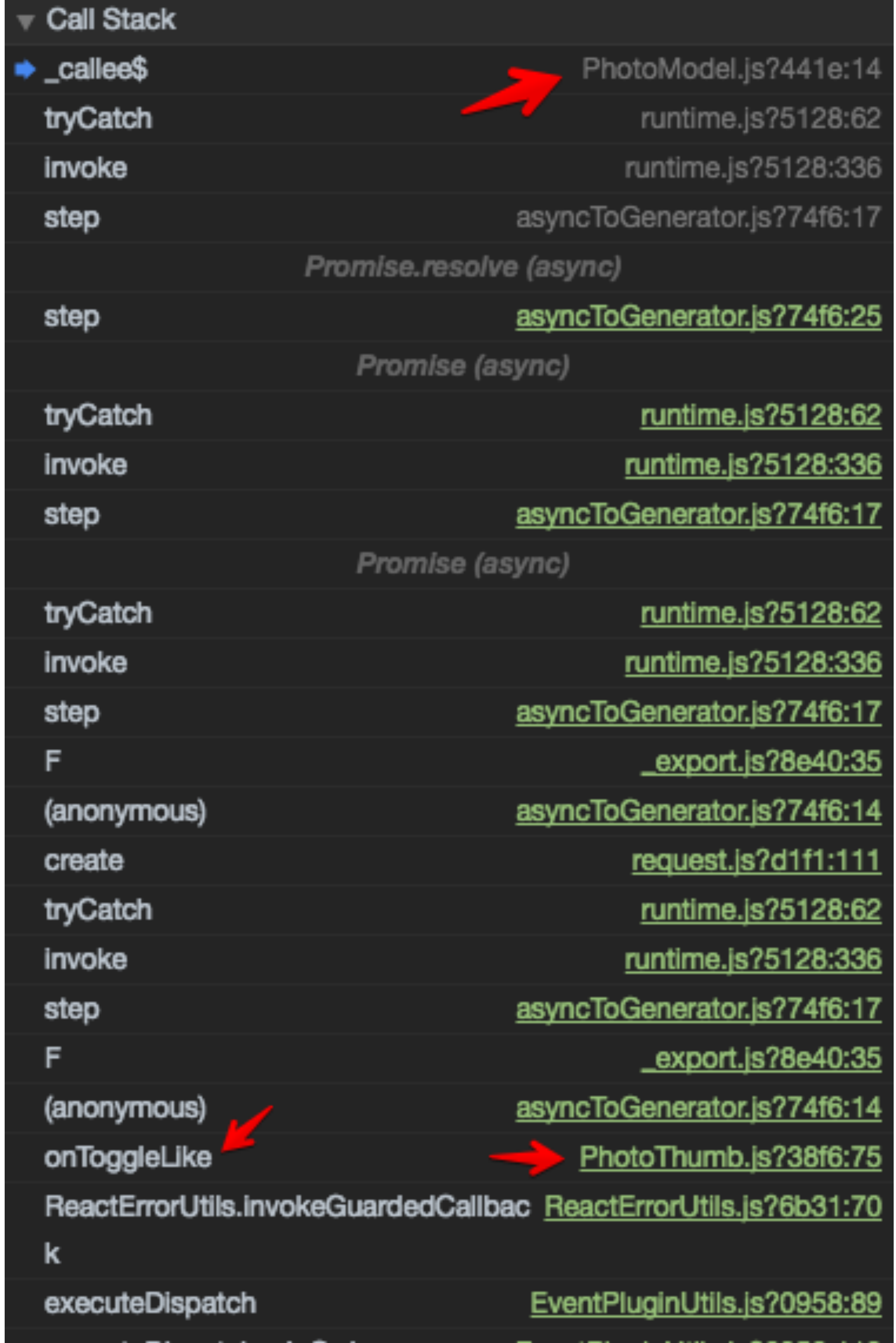
- Build process

THE PROBLEM

- Build process
- Slow

THE PROBLEM

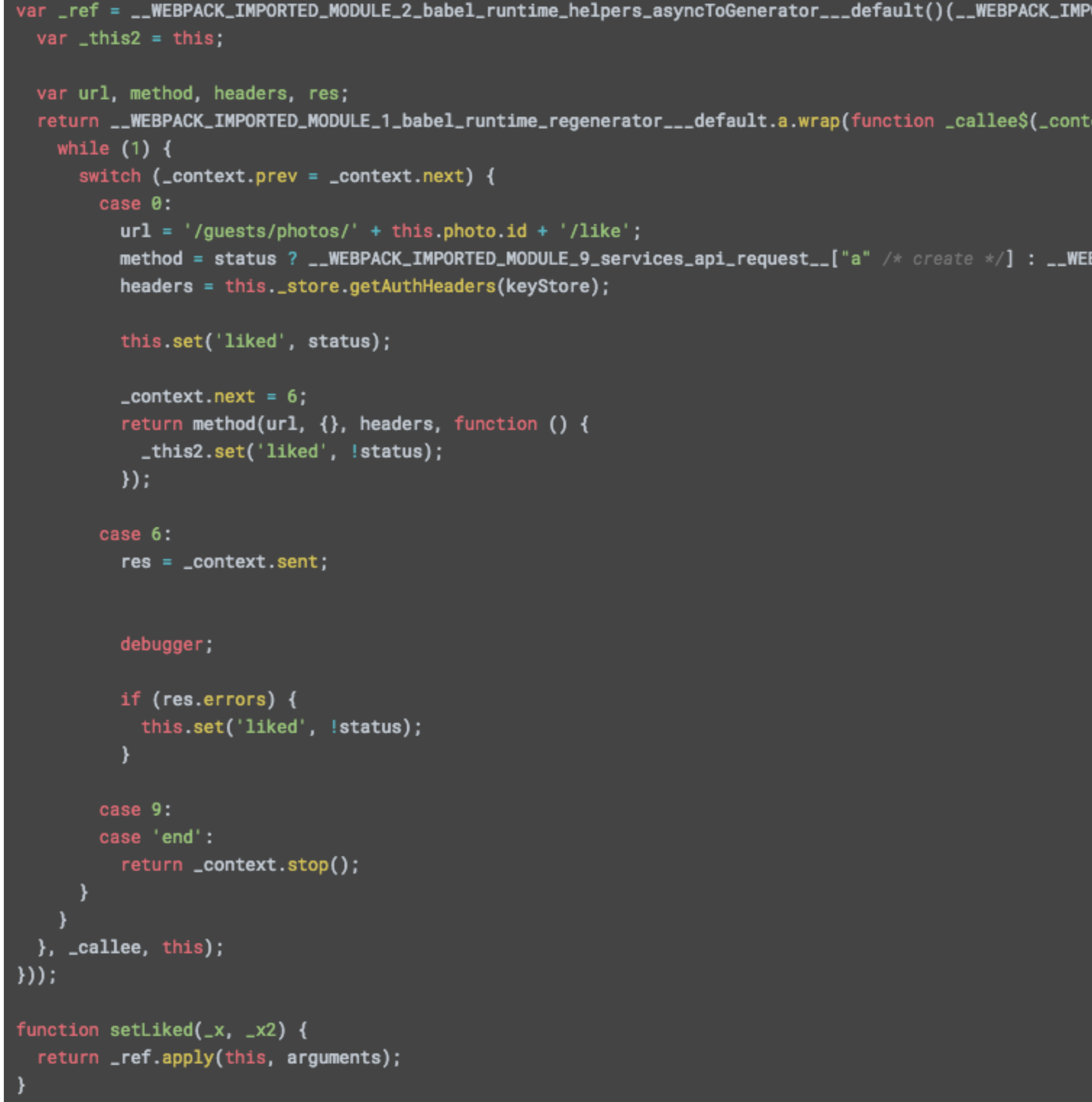
- Build process
- Slow
- Hard to debug



```
▼ Call Stack
➡ _callee$                          PhotoModel.js?4441e:14
  tryCatch                            runtime.js?5128:62
  invoke                              runtime.js?5128:336
  step                         asyncToGenerator.js?74f6:17
              Promise.resolve (async)
  step                         asyncToGenerator.js?74f6:25
                  Promise (async)
  tryCatch                            runtime.js?5128:62
  invoke                              runtime.js?5128:336
  step                         asyncToGenerator.js?74f6:17
                  Promise (async)
  tryCatch                            runtime.js?5128:62
  invoke                              runtime.js?5128:336
  step                         asyncToGenerator.js?74f6:17
  F                                    _export.js?8e40:35
  (anonymous)                  asyncToGenerator.js?74f6:14
  create                             request.js?d1f1:111
  tryCatch                            runtime.js?5128:62
  invoke                              runtime.js?5128:336
  step                         asyncToGenerator.js?74f6:17
  F                                    _export.js?8e40:35
  (anonymous)                  asyncToGenerator.js?74f6:14
  onToggleLike                      PhotoThumb.js?38f6:75
  ReactErrorUtils.invokeGuardedCallbac ReactErrorUtils.js?6b31:70
  k
  executeDispatch               EventPluginUtils.js?0958:89
```

THE PROBLEM

- Build process
- Slow
- Hard to debug
- Not the same code



```
var _ref = __WEBPACK_IMPORTED_MODULE_2_babel_runtime_helpers_asyncToGenerator___default()(__WEBPACK_IMP
  var _this2 = this;

  var url, method, headers, res;
  return __WEBPACK_IMPORTED_MODULE_1_babel_runtime_regenerator___default.a.wrap(function _callee$(_cont
    while (1) {
      switch (_context.prev = _context.next) {
        case 0:
          url = '/guests/photos/' + this.photo.id + '/like';
          method = status ? __WEBPACK_IMPORTED_MODULE_9_services_api_request__["a" /* create */] : __WEB
          headers = this._store.getAuthHeaders(keyStore);

          this.set('liked', status);

          _context.next = 6;
          return method(url, {}, headers, function () {
            _this2.set('liked', !status);
          });

        case 6:
          res = _context.sent;


          debugger;

          if (res.errors) {
            this.set('liked', !status);
          }

        case 9:
        case 'end':
          return _context.stop();
      }
    }
  }, _callee, this);
}));

function setLiked(_x, _x2) {
  return _ref.apply(this, arguments);
}
```

HOW WE GOT HERE?

LET’S TAKE A TRIP DOWN MEMORY LANE

2007

ES4

ES4 FEATURES

Modules

Classes

Generators

Strong typing (!)

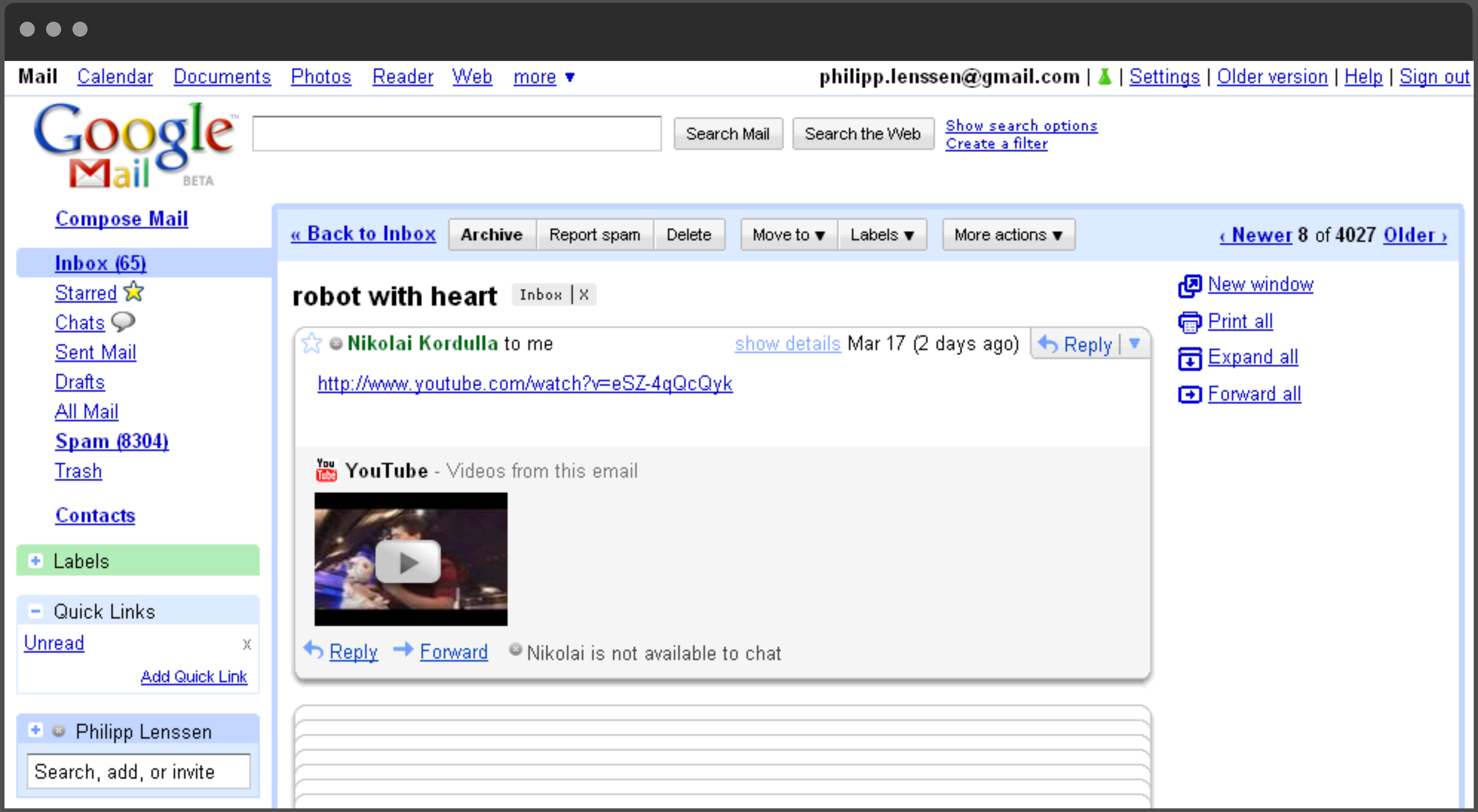
WHAT HAPPENED?

- Community wasn’t ready for it
- Some features moved to “harmony”
- ES5 instead – small improvements

2009

Gmail

Still has the invite form :D



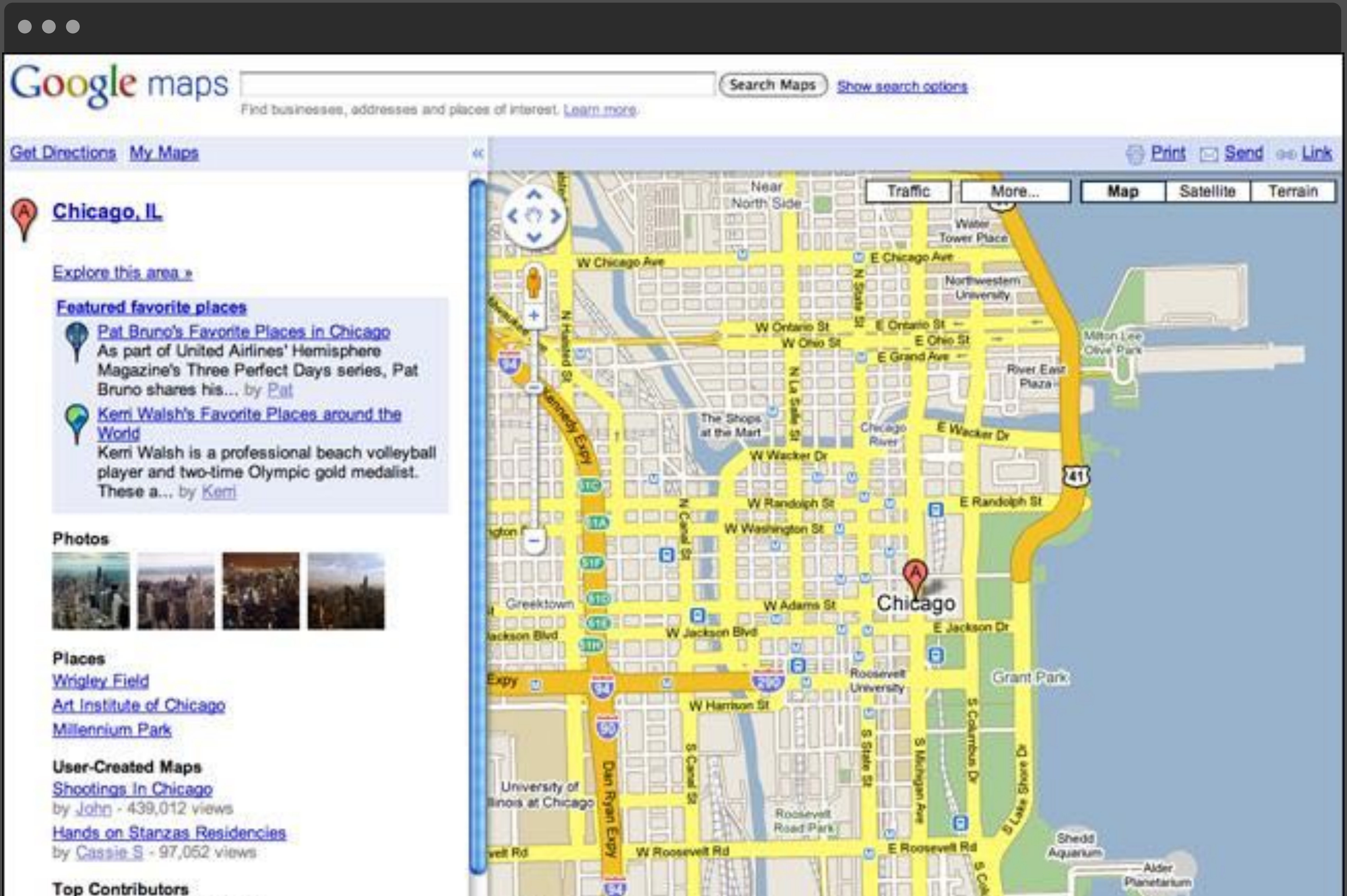
robot with heart

Nikolai Kordulla to me — Mar 17 (2 days ago)

http://www.youtube.com/watch?v=eSZ-4qQcQyk

Nikolai is not available to chat

Google Maps



Chicago, IL

Explore this area »

Featured favorite places

Pat Bruno's Favorite Places in Chicago
As part of United Airlines' Hemisphere Magazine's Three Perfect Days series, Pat Bruno shares his... by Pat

Kerri Walsh's Favorite Places around the World
Kerri Walsh is a professional beach volleyball player and two-time Olympic gold medalist. These a... by Kerri

Photos

Places

Wrigley Field

Art Institute of Chicago

Millennium Park

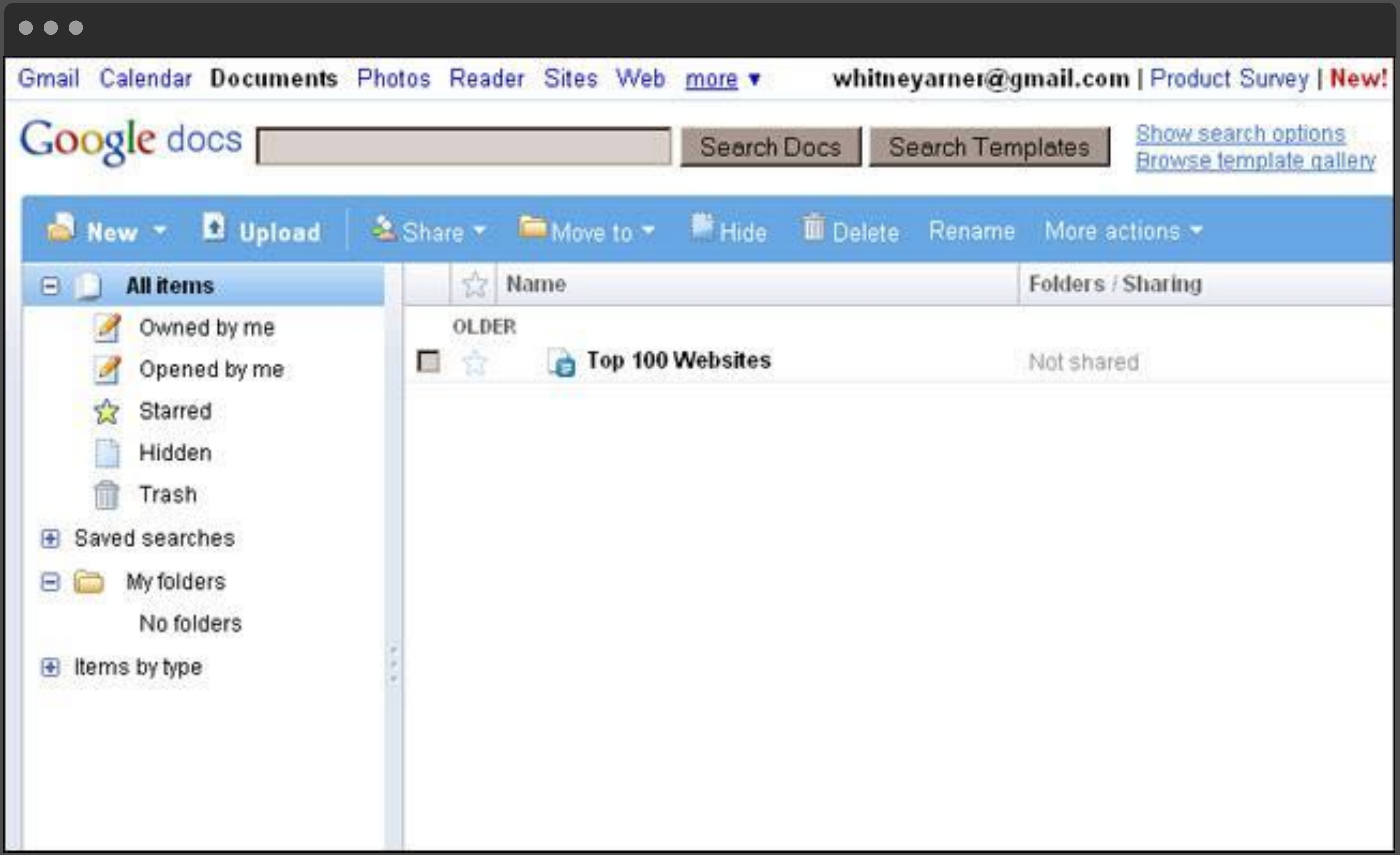
User-Created Maps

Shootings In Chicago
by John - 439,012 views

Hands on Stanzas Residencies
by Cassie S - 97,052 views

Top Contributors

Google Docs



Name	Folders / Sharing
Top 100 Websites	Not shared

2010

CoffeeScript

2012

HTML5 Candidate

ES2015

a.k.a. ES6

HUGE

ES2015: 566 pages

ES5.1: 258 pages

ES2015 FEATURES

Major

- Modules
- Generators
- Classes
- Proxies

A little less major :)

- Spread/rest
- Arrow fns
- TCO
- Destructuring
- Symbols
- let/const

USE ALL THE FEATURES!

TRANSPILE ALL THE THINGS!

TRANSPILING?

- Source–to–source compilation
- Next gen JS to the JS of today

SOURCEMAPS

- Mapping transpiled code to source
- JS and CSS
- Dev only!

TRACEUR COMPILER

6TO5

BABEL

USE ALL THE FEATURES!

ES2015 FEATURES

Major

Modules

Generators

Classes

Proxies

A little less major :)

Spread/rest

Arrow fns

TCO

Destructuring

Symbols

let/const

ES2015 IN PRACTICE

OUR FIRST ES2015 PROJECT

- February 2015
- Backbone + Require.js + Browserify + Grunt + 6to5
- 96 view files
- 45 collections

ISSUES

- 10s build time for “empty” project
- Just before production:
  - 2–3min full build
  - 10–15s with caching
- Stack traces were horrible
- Sourcemaps off

IT WAS ALL WORTH IT…

~20% less code

a lot of requirement changes

“Make it work in IE8”

…BUT IT GETS BETTER

Better tools

Faster tools

Simpler tools

“MODERN” EXAMPLE

- Backbone + Webpack + Babel
- ~130 JS files, ~40 SCSS files, ~30 assets → ~110 000 LOC
- Full build: ~30s
- 2–3s after every change

THE BROWSER

2009

2009

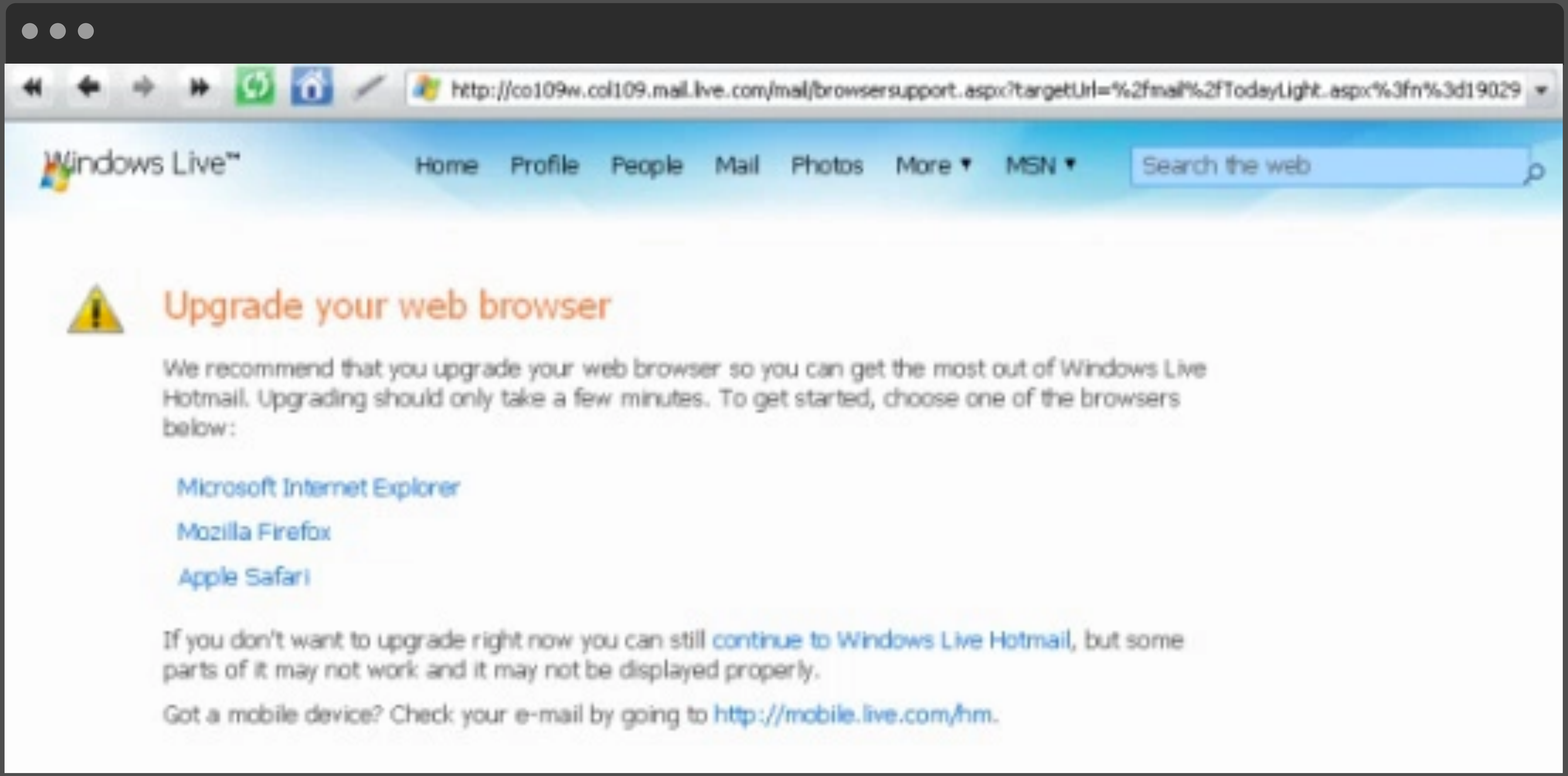
Chrome 3

Firefox 3.5

Safari 4

Internet Explorer 8

Opera 10


http://co109w.col109.mail.live.com/mail/browsersupport.aspx?targetUrl=%2fmail%2fTodayLight.aspx%3fn%3d19029
Windows Live™
Home
Profile
People
Mail
Photos
More ▾
MSN ▾
Search the web

Upgrade your web browser

We recommend that you upgrade your web browser so you can get the most out of Windows Live Hotmail. Upgrading should only take a few minutes. To get started, choose one of the browsers below:

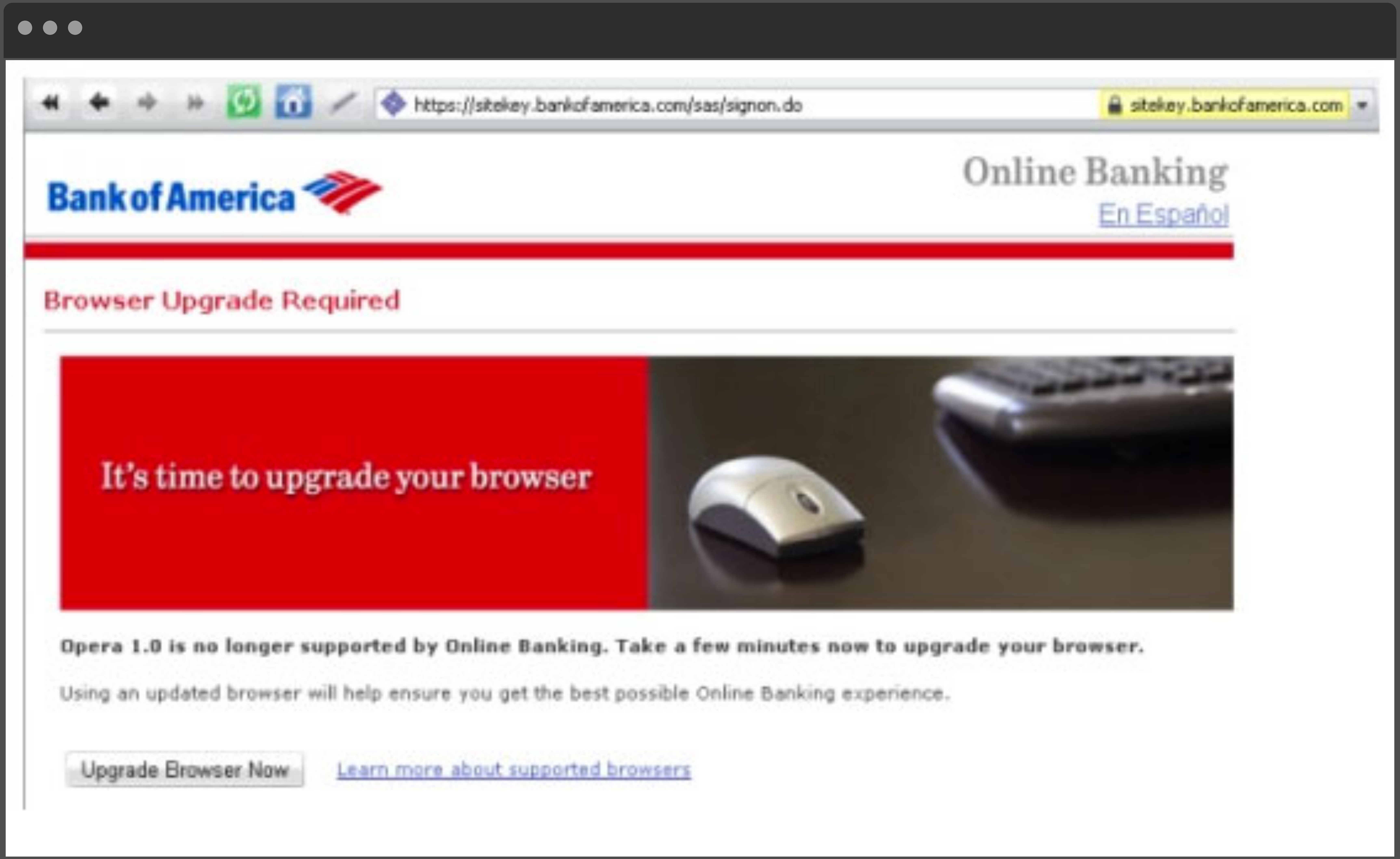
Microsoft Internet Explorer

Mozilla Firefox

Apple Safari

If you don't want to upgrade right now you can still continue to Windows Live Hotmail, but some parts of it may not work and it may not be displayed properly.

Got a mobile device? Check your e-mail by going to http://mobile.live.com/hm.



https://sitekey.bankofamerica.com/sas/signon.do

sitekey.bankofamerica.com
Bank of America
Online Banking
En Español

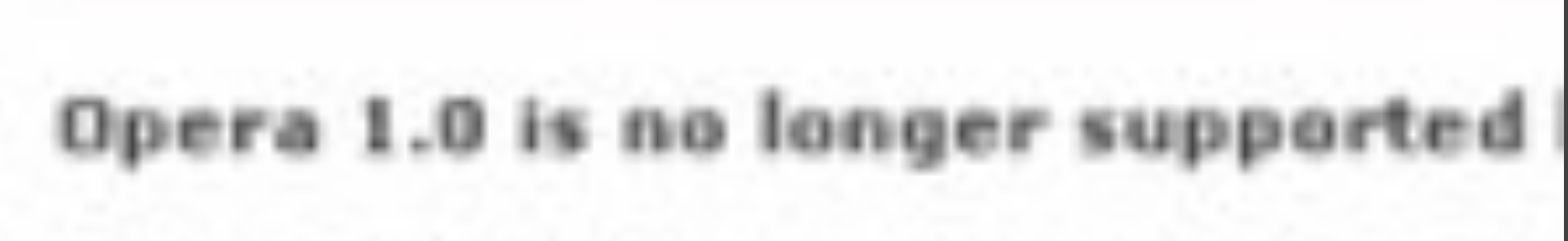
Browser Upgrade Required

It's time to upgrade your browser

Opera 1.0 is no longer supported by Online Banking. Take a few minutes now to upgrade your browser.

Using an updated browser will help ensure you get the best possible Online Banking experience.

Upgrade Browser Now
Learn more about supported browsers

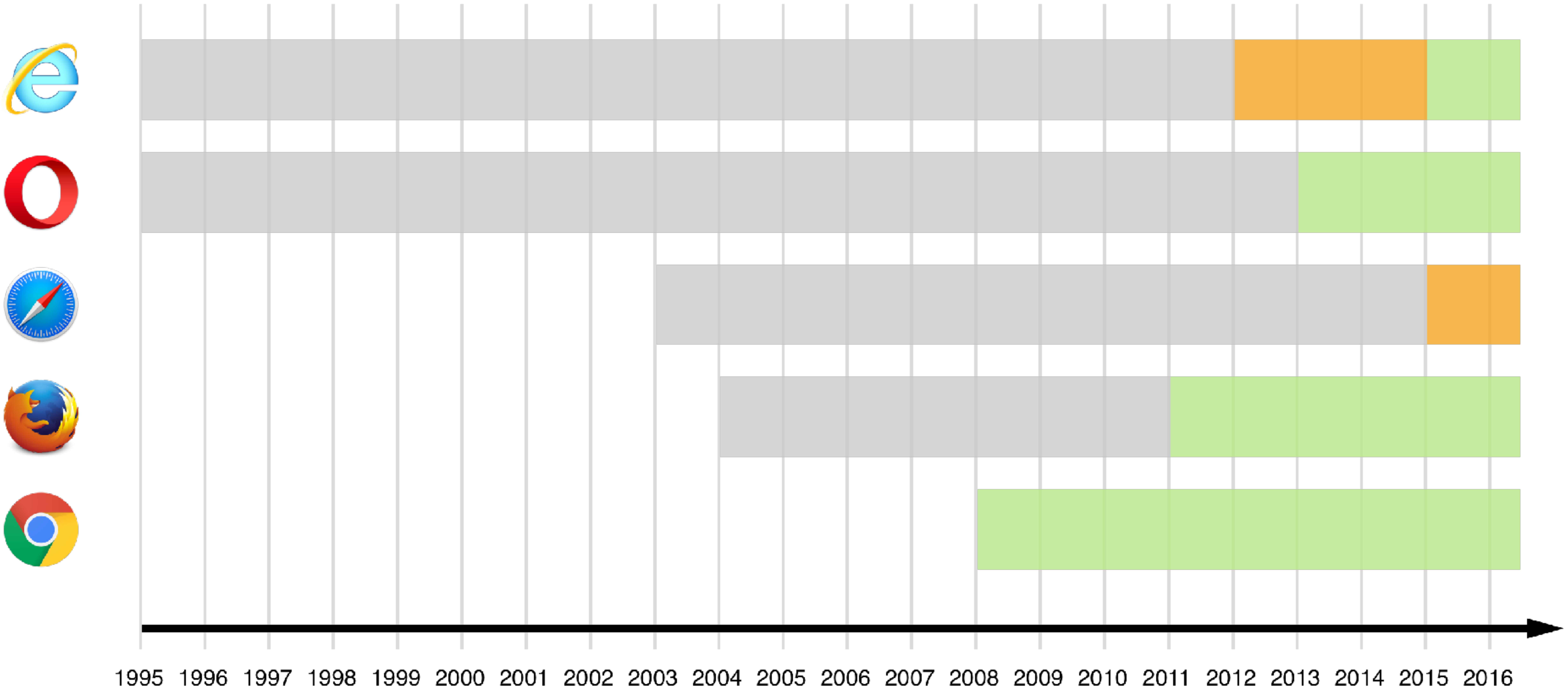


Opera 1.0 is no longer supported

… IN THE MEANTIME …

EVERGREEN BROWSERS!

BROWSER HISTORY



MOBILE PLATFORM HISTORY

- Android WebView– Evergreen since 5.0 (2014)
- Android Browsers – Chrome default since 4.0 (evergreen)
- iOS – Yearly Safari updates 😕
- Windows Mobile – Evergreen since 10 (2015)

2016

Desktop browsers														
11%	83%	93%	86%	92%	92%	94%	94%	97%	97%	97%	54%	100%	100%	100%
IE 11	Edge 13[4]	Edge 14[4]	FF 45 ESR	FF 49	FF 50 Beta	FF 51 Aurora	FF 52 Nightly	CH 53, OP 40[1]	CH 54, OP 41[1]	CH 55, OP 42[1]	SF 9	SF 10	SF TP	WK
0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	2/2	2/2	2/2
0/7	0/7	7/7	4/7	4/7	4/7	6/7	6/7	7/7	7/7	7/7	0/7	7/7	7/7	7/7
0/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	0/5	5/5	5/5	5/5
0/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	15/15	9/15	15/15	15/15	15/15
0/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	5/6	6/6	6/6	6/6
0/9	7/9	7/9	7/9	7/9	7/9	7/9	7/9	9/9	9/9	9/9	8/9	9/9	9/9	9/9
0/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
0/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5
0/5	5/5	5/5	2/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5	0/5	5/5	5/5	5/5
0/22	0/22	21/22	19/22	21/22	21/22	21/22	21/22	22/22	22/22	22/22	19/22	22/22	22/22	22/22

4%	12%	53%	18%	45%	51%	54%	54%	40%	57%	80%	6%	42%	74%	74%
IE 11	Edge 13[2]	Edge 14[2]	FF 45 ESR	FF 49	FF 50 Beta	FF 51 Aurora	FF 52 Nightly	CH 53[3]	CH 54[3]	CH 55[3]	SF 9	SF 10	SF TP	WK
0/3	0/3	3/3	0/3	0/3	0/3	0/3	0/3	3/3	3/3	3/3	0/3	0/3	3/3	3/3
0/3	0/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	2/3	3/3	3/3	3/3
No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
No	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes
No	Flag	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
No	Flag	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes

🎉✨🎉✨🎉

PARTY LIKE IT’S 2009?

✨🎉✨🎉✨

TRANSPILING FOR MODERN BROWSERS…

Simplifying something they already understand

BIG WORDS THAT TELL YOU WHAT THIS BOOK IS

THING EXPLAINER

COMPLICATED STUFF IN SIMPLE WORDS

DATA CENTER

Computer building

~~MICROWAVE~~

food–heating radio box

~~ENCYCLOPAEDIA~~

Thing explainer

~~THOUSAND~~

Ten hundred

THE SOLUTIONS

Dev mode

Feature detection

DEV MODE

- Don’t transpile features your dev env supports
- Chrome → ES2015 + ES2016 + async/await

DEV MODE – PROS

- Faster builds
- Smaller bundles
- Faster execution
- Easier to debug

DEV MODE – CONS

- Separate configuration
- Not 100% the same – staging is important
- Tests should use full build

FEATURE DETECTION

- Group supported browsers into groups (GA?)
- Determine ES2015/ES2016/ES2017 support
- Make separate bundles
- Load the best fitting bundle

FEATURE DETECTION – PROS

- Best case scenario optimization
- Most visitors use Chrome/Firefox anyway
- Smaller bundles
- Faster execution

FEATURE DETECTION – CAVEATS

- Complicated configuration
- Not 100% the same
- All versions should be tested
- JS loading delayed

BABEL TO THE RESCUE!

- babel-preset-env
- “Autoprefixer for JS”
- ~~Early stage of development~~
- v0.0.4

BABEL-PRESET-ENV EXAMPLE

```
{
  "presets": [
    ["env", {
      "targets": {
        "chrome": 52
      }
    }]
  ]
}
```

WHAT ABOUT CSS?

RIGHT NOW...

- Autoprefixer
- CSS next
  - variables (a.k.a. custom properties)
  - apply (mixins, sort of...)
  - A lot of other stuff
- Fallbacks
- @supports

FUTURE

HOUDINI

- Ability to extend CSS
- (Very) Low level
- Real polyfills!
- W3C + Apple, Opera, Mozilla, Microsoft, Google, Adobe, HP
- Chrome & Firefox – in development

> *Houdini: Maybe The Most Exciting Development In CSS You’ve Never Heard Of*
>
> – PHILIP WALTON, SMASHING MAGAZINE

https://www.smashingmagazine.com/2016/03/houdini-maybe-the-most-exciting-development-in-css-youve-never-heard-of/

SUMMARY

JAVASCRIPT

- Transpilers – use newest features today
- Avoid transpiling in development
- Handle old browsers separately

CSS

- Autoprefixer, CSS next – use newest features today
- Fallbacks – OK experience for the rest
- Much better in the future

INFINUM

Thank you!

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RESOURCES

- Babel
  - https://github.com/babel/babel-preset-env
- CSS
  - https://github.com/postcss/autoprefixer
  - http://cssnext.io/
  - https://developer.mozilla.org/en-US/docs/Web/CSS/@supports
- Houdini
  - https://developers.google.com/web/updates/2016/05/houdini
  - https://www.youtube.com/watch?v=sE3ttkP15f8