Reinventing Web-Applications: Coding for the Future

Demographic Surveys Division
Jeffrey O'Neil
Zachariah Meade Turner
Brian Barenbaum
Richard Lee Downs

CIVIC DIGITAL FELLOWSHIP

Li Wang
Massachusetts Institute of Technology

Project 1: Build a New Housing Data Product for the American Housing Survey

American Housing Survey (AHS) Website Breakdown
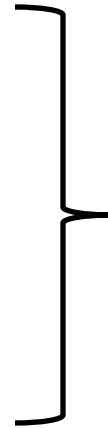
Parameters
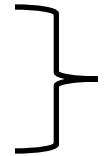
Filters
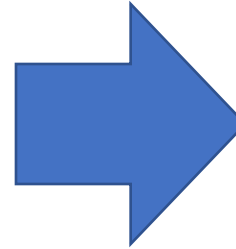
Characteristics	National
Total	118,290
Rooms	
1	504
2	1,170
3	9,209
4	19,777
5	26,265
6	25,330
7	16,942
8	10,460
9	4,728
10 or more	3,905
Persons per Room	
0.50 or less	85,888
0.51 to 1.00	29,874
1.01 to 1.50	2,152
1.51 or more	377

Census Data Given Specific Parameters

Challenges

01

The AHS Website was coded a long time ago. The platform that it was coded on is currently outdated and incompatible with the latest technologies.

02

As information was updated, repetition of previous code (formerly used to optimize code compilation, rolled out loop method), made functions difficult to test.
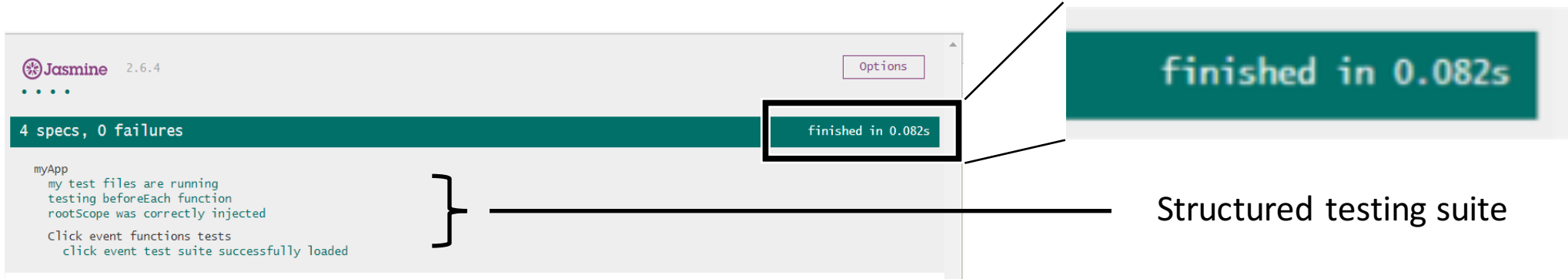
03

People tested the application by hand. Because of the sheer number of classes used to style the website, small discrepancies between web browsers and screen size cam to fruition.

Time Loss: Manual Testing

	Parameters				Filters		**Time to Physically Input Information:**
Areas	Years	Tables	Variables				
42 x	3 x	24 x	27 x	27 x	3	x	5 secs

= 9185 Hours = 230 Work Weeks

Solution Pt. 1: Automated Testing
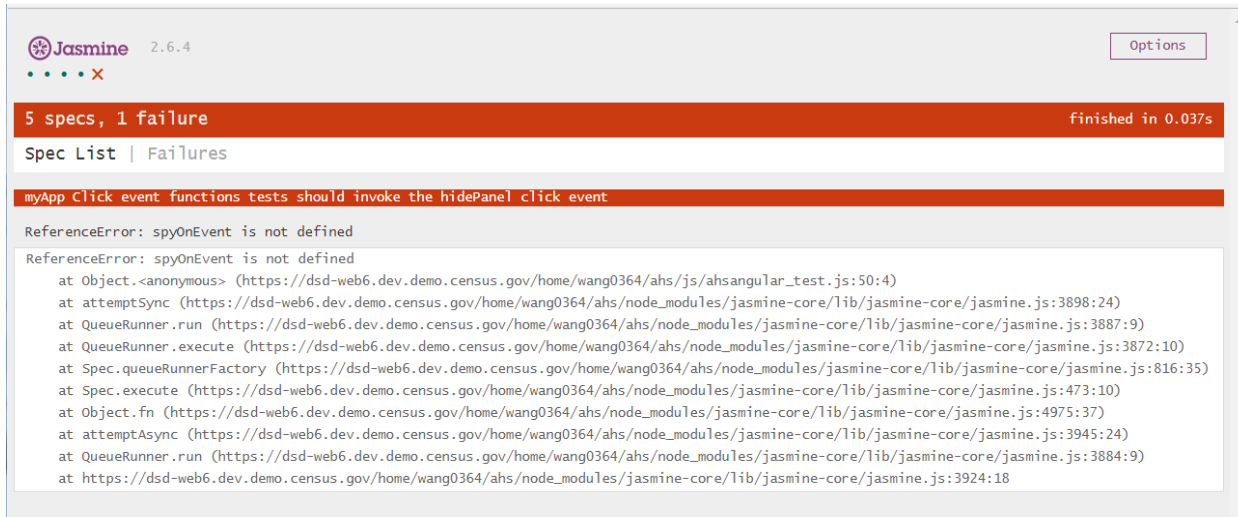
finished in 0.082s

Structured testing suite

Stack trace

Solution Pt. 2: Better Coding Practices

Before

```
301
302
303         //all widths must match what's in the style.css and style-ie.css files.
304
305         $(".resultsContainer").animate({
306             marginLeft : "1px",
307             width : "749px"
308         }, 200);
309
310         $("#results").animate({
311             width : "749px"
312         }, 200);
313
314         $(".container").animate({
315             width : "320px",
316             opacity : 1
317         }, 400);
318
319         $("#showPanel").animate({
320             width : "0px",
321             opacity : 0
322         }, 200).hide("slow");
323
324         $(".button").animate({
325             opacity : 1
326         }, 1000);
327
328         $(".reset").animate({
329             opacity : 1
330         }, 1000);
331
332     });
333
334     //jQuery('table').Scrollable(100, 800);
335
;
337
```

Repetition

337

After

```
1
2     angular.module('raApp').service('homeService', homeService);
3
4     function homeService(jsom){
5         function getData(){
6             return jsom.getItems({list:"resourceInformation",
7                 fields:["ID", "resourceName", "resourceType", "daysBetweenAudits"]})
8                 .then(function (response) {
9                     return response;
10                });
11         }
12        return {
13            getData: getData
14        }
15    }
16
17
```

Modularization

17

Project 2: Improve Workflows By Integrating Open Source Front-End Technology

Auditor's name

JamesBondID

(Name of Application) (optional)

My Audits   **Audit History**

Order By: [Due Date ▼]   Show: All   Incomplete   Completed

Group Name	Type of Group	Due Date	Last Audit	Status
(Name of group being audited)	(LDAP, Sharepoint, etc.	(Date the audit is due)	(Last date reviewed)	(Complete or incomplete)

Problem

1

The old personnel auditing system used outdated technology that will be difficult and expensive to maintain as the Census Bureau transitions to newer technologies.

2

For applications coded in Angular, a newer version has begun to replace Angular 1, whose functions are no longer supported by up-to-date testing platforms such as Jasmine.

Benefits of the Newer Angular

01
It is compatible with node.js (used in many newer applications) and PHP (used in many older applications.

02
It has an faster code optimization routine.

03
It comes with built-in testing frameworks such as Jasmine and Karma

04
It comes with its own set of methods and style classes that are constant in functionality between different operating systems.

Application Using New Angular (MVP)

Shared Component

Go Home

My Audits

Name	Type	☰	Group ID	Due Date	Last Audit	Status		
DSD	LDAP Group		1	Wed Feb 22 2017	Mon Jan 23 2017	incomplete	Complete Audit	View Audit History
DSD Sharepoint	Sharepoint		3	Tue Mar 07 2017	Wed Feb 22 2017	incomplete	Complete Audit	View Audit History
Comm	Sharepoint		4	Thu Mar 09 2017	Fri Feb 24 2017	incomplete	Complete Audit	View Audit History
R&D	LDAP		5	Sat Apr 08 2017	Thu Mar 09 2017	incomplete	Complete Audit	View Audit History

Component specific to page

Simple injection of data to router

Chart created from Angular class

To The Future

Old practices were tailored to the necessity of the time. Though they worked well many years ago when technology was different, they are not always the most efficient for the modern era.

As new technologies are created, software engineers should be open and willing to use them.