CSS 497: Undergraduate Capstone — Report #1

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Introduction

As a student in University of Washington Bothell's (UWB) Computer Science and Software Engineering (CSSE) Department, the last requirement I have to fulfill in order to receive my degree is to complete one of several Capstone requirements. The requirement that I chose is to complete a 400 hour internship at a company of my choice. I have chosen to split up the 400 hours over the course of two quarters at UWB. Doing so will have me finished with my internship and ready to present at the CSSE Colloquium this coming December.

The faculty advisor for my internship is Professor David Socha. He has been my professor for two quarters so far at UWB. Throughout his courses, I have enjoyed working with him on his research projects as well as other various class-related projects. The company that is sponsoring my internship is called Helpful Human. Helpful Human is a small (3 person) startup company located in Seattle. They are capable of producing full front-end software solutions for clients' needs ranging from simple websites to complex web applications.

The following report will provide a brief overview of what it has been like to be a front-end developer during my first 3 weeks interning at Helpful Human. I will discuss what I've learned about the company culture as well as describe some highlights and challenges that I've encountered.

Being a Helpful Human

The world of web development is one full of exciting things to learn, with a seemingly endless amount of opportunities offered. Helpful Human is located in a coworking office space called WeWork. The WeWork office space has sparked many business opportunities for Helpful Human leading to company growth and success under the leadership of the owner, Mark Sandeno. Mark is an entrepreneur who has started and grown multiple companies from the ground up. He brings business skills and technical aptitude to the workplace as we interact with clients on projects. Nick Glenn, who functions as the company's lead developer, brings years of experience to the team with a strong background of programming beginning at 9 years old. Under Nick's guidance and Mark's direction, we are dedicated to producing quality products curated to client's custom needs.

Company Culture

Whether it be learning about some new web language or communicating with clients on a project, there's always something to do at Helpful Human. It's neat to see this company practicing a similar type of programming methodology to what I've learned in my classes at UWB. We have regular meetings twice a week; one on Monday to plan the week's Sprint and one on Friday that acts as a retrospective so we can reflect on what did during the week. Because all three of us live up in Edmonds, Everett, and Mukilteo, we choose to commute together to save on gas and to give us an opportunity to discuss the day ahead. *Figure 1: The Typical Work Week* provides an overview of what the past three weeks at work have looked like.

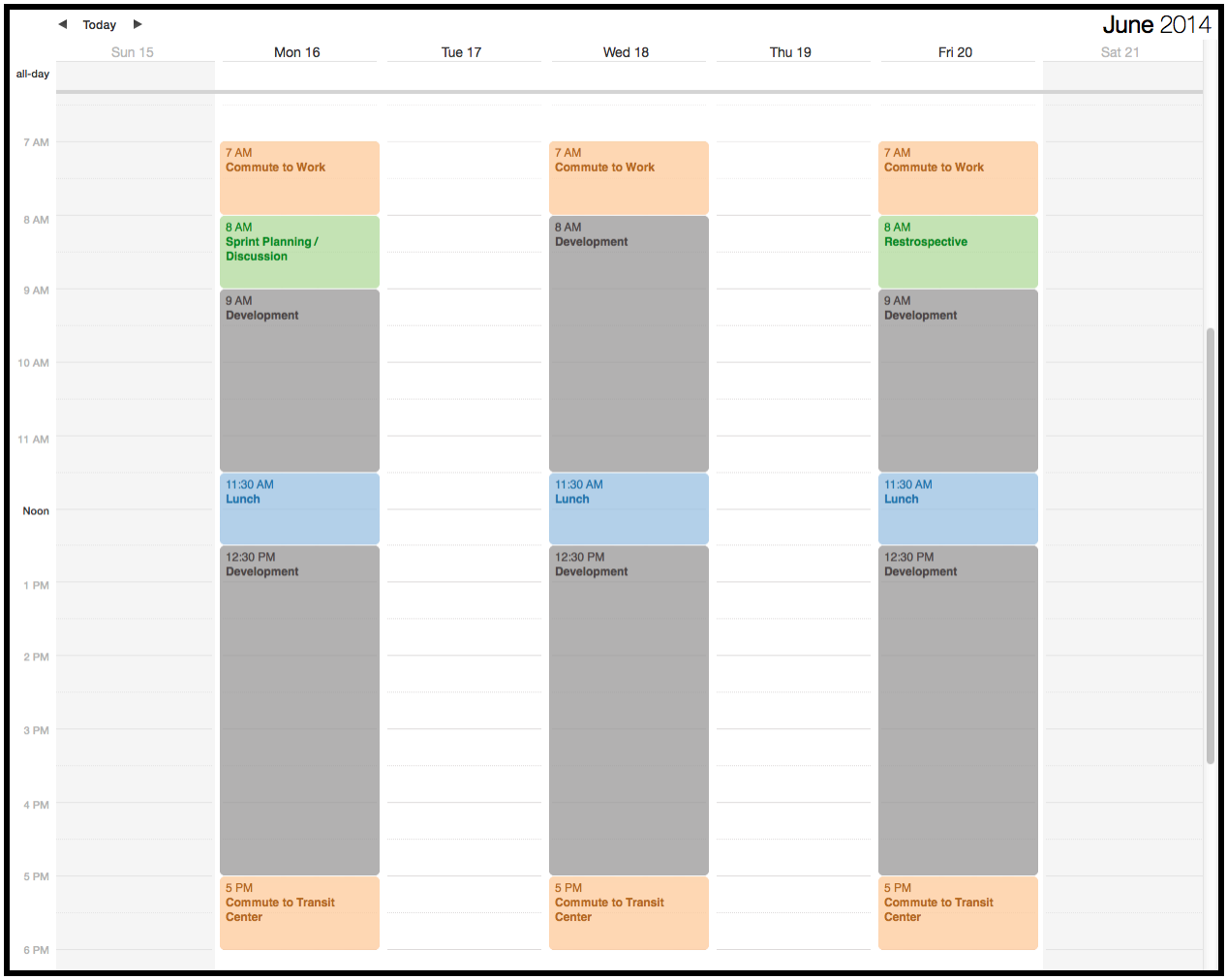

Figure 1: The Typical Work Week

Online Services

As with any company, there are a set of services that are used religiously to keep the company organized and on task. At Helpful Human, the primary services are Trello, Slack, Freshbooks, ZenPayroll, and Bitbucket.

- Trello is used to manage our various projects and backlog tasks. With each card on the board, we try to assess how much time it will take to complete each project/task so that we can appropriately plan for its completion during the sprint meeting.
- Slack is used to communicate securely and efficiently across our team. We have different “channels” which allow us to chat internally with our coworkers and externally with our clients. Slack allows us to upload media and paste links so that others can see and hear what we have to say.
- Freshbooks helps us to keep track of time spent on certain projects. Every time we change what we are working on or simply take a break, we start/stop the timer. This allows Mark to see how much billable work we have done during the course of the week.

- ZenPayroll allows the employees to see how much money we've made by simply logging into the website. ZenPayroll also allows us to see our deductions to charities.
- BitBucket is the desired Git repository client that we interface with. Because Bitbucket allows for low cost private repositories, it made sense for us to use them as we version control large client projects.

Code Acceleration

When I joined the team as an intern for front-end development, one of the first things they had me do was to get on a code accelerator. Nick had me go through the online courses offered by Codeacademy to give me a brief refresher on HTML and CSS. In addition, he had me do the overview course on JavaScript so that I could get a grasp on what I would be interacting with during my employment. Once I had completed those three courses, Nick signed me up for another company called Code School, which offered much more detailed courses on JavaScript.

One of the projects that Nick had planned for me to work on was dealing with a language called CoffeeScript, which compiles into JavaScript. The benefit to using CoffeeScript is that you can write less code and have it simply compile into JavaScript. See *Figure 2: CoffeeScript to JavaScript Conversion* for an example (CoffeeScript on right, compiled JavaScript on left).


```
# Eat lunch.
eat food for food in ['toast', 'cheese', 'wine']

# Fine five course dining.
courses = ['greens', 'caviar', 'truffles', 'roast', 'cake']
menu i + 1, dish for dish, i in courses

# Health conscious meal.
foods = ['broccoli', 'spinach', 'chocolate']
eat food for food in foods when food isnt 'chocolate'
```

```
var courses, dish, food, foods, i, _i, _j, _k, _len, _len1,
_len2, _ref;

_ref = ['toast', 'cheese', 'wine'];
for (_i = 0, _len = _ref.length; _i < _len; _i++) {
  food = _ref[_i];
  eat(food);
}

courses = ['greens', 'caviar', 'truffles', 'roast', 'cake'];

for (i = _j = 0, _len1 = courses.length; _j < _len1; i = ++_j) {
  dish = courses[i];
  menu(i + 1, dish);
}

foods = ['broccoli', 'spinach', 'chocolate'];

for (_k = 0, _len2 = foods.length; _k < _len2; _k++) {
  food = foods[_k];
  if (food !== 'chocolate') {
    eat(food);
  }
}
```

Figure 2: CoffeeScript to JavaScript Conversion
Source: http://coffeescript.org/

After I had completed my training on CoffeeScript, Nick had me move to jQuery. jQuery allows the developer (me) to query certain elements and attributes of a web page. Doing so provided me the ability to change and alter different aspects of the Document Object Model (DOM). Once I had completed the two courses on jQuery, Nick moved me to learning about my first JavaScript

framework, called Angular. Angular allows developers to transform a simple HTML web page into a full-blown application using tools called Directives and Controllers.

Once I had learned these 6 different web languages, I was ready to plunge into real-world problems. Nick handed me over the big project that Helpful Human is currently working on. For privacy restrictions, I am unable to say the name of the company. Nevertheless, it's a big project which involves what is known as a "full-stack" of development. In a brief summary of what full-stack is, it involves developing the front-end and the back-end of a web application. Nick's ultimate goal is for me to be able to handle the front-end of things while he can focus on the back-end. You can learn what the "full-stack" is here.

Highlights

Over the past 3 weeks, I have gotten the chance to work on some pretty neat things. In this section, I will highlight two of my favorite tasks that I had the opportunity to work on.

My First Bug

Nick assigned me the task of figuring out why a check box wasn't showing as checked when it should have been. A seemingly simple bug turned out to be a 45 minute search through documentation on HTML, CSS, and Angular. As it turned out, the solution was to make an Angular request to the JSON object that contained a boolean representing if the user logged in was an administrator or not. As complicated as it may seem, the code to fix the checkbox was `checked="{{user.admin}}"`. The `{{user.admin}}` is an Angular request that checks the `user` object and returns the value of the boolean object `admin` (a `0` or a `1`). If the user is an admin (returns `1`), the checked attribute is true and the box is therefore checked on the web page. If `admin` returns `0`, the `user` is not an administrator and thus the checkbox is unchecked. Both Nick and Mark gave me a high-five to congratulate me on solving my first bug.

My First Website

After I had completed my training on HTML and CSS (the styling and placement of website interfaces), Nick's first task for me was to create my own website from scratch. This meant coding up the HTML and the CSS and then publishing it to the web.

Since this was the first time I had done such a task, I spent a lot of time conceptualizing how these two languages worked together to produce an end product (a website). After I understood what needed to be done, I got to work and designed the website as a blog that I can update every week throughout my internship. *Figure 3: CSS 497 - Internship Blog* provides a screenshot of what the website looks like.

Figure 3: CSS 497 - Internship Blog
Source: http://students.washington.edu/rennurb/

Challenges

As in any development environment, there are areas where things seem unclear and tasks get held up due to various constraints. This section will briefly describe two areas where I have faced some sort of challenge in the past 3 weeks.

Conceptualizing Web Systems

An area that I know I need to work on is gaining a better understanding of how large systems come together to produce an end product. Since we design fully customized solutions for clients, plug-and-play technologies like Wordpress and Bootstrap rarely fit the needs of our clients. Thus, it is imperative that we know and understand all aspects of web development (the “full-stack”).

Coming from learning Java and C++ in my schooling, these web systems are large and complex, and the way we interact with them is inherently different. While the complexity of them is a challenge for me to understand, I have full confidence that I will get better and better at navigating my way through them.

Estimated Completion Time

One of the things Mark cares a lot of about is keeping track of how much time we think we'll spend on a task compared to how much time we actually spend on a task. During my training, I was able to estimate within 10 minutes of how long it would take me to complete a course. However, when I got to working on troubleshooting and coding up components, I'm afraid my estimation skills were not as spot-on.

Both Nick and Mark have ensured me that as I progress through designing up code solutions, I will gain a better understanding of how long certain tasks will take.

Next Steps

As I continue to work at Helpful Human under the umbrella of "an intern," I am excited to learn more about these complex web systems. The opportunities available to me at Helpful Human are endless, and I am excited to be a part of a young company at this stage in its growth.

Now that I am done with my training, I expect the next 3-4 weeks to be filled with a lot of bug squishing and cups of coffee. You can expect the the Report #2 at the end of August.