

Digital Media Design Capstone Proposal

Harvard Extension School
Harvard University
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Anticipated Graduation Date: March 2019

1. Project Scope

1.1. Tentative Project Title

Tri-Cities Wine Hub

1.2. Project Goal

The primary goal and underlying passion for my capstone project, *Tri-Cities Wine Hub*, is to create a community-focused, feature-rich dynamic web application for wine enthusiasts in the Tri-Cities' wine-growing region of Washington state (my hometown). Currently, the Tri-Cities, which is located in Southeastern Washington and is comprised of the medium-sized cities of Kennewick, Richland, and Pasco, has a fairly minor internet presence within the wine hobbyist community and is often times overshadowed on the larger platforms by more popular wine regions, such as California's Napa and Sonoma valleys. I not only realized this as I prepared and researched ideas for my capstone, but I also came to this realization as a wine tourist and enthusiast. I feel that *Tri-Cities Wine Hub* can address the vacuum that currently exists for what is otherwise a burgeoning and robust wine region.

Tri-Cities Wine Hub will not merely be an informational website nor a wine rating web application but will embrace an all-encompassing approach to local wine tasting in Southeastern Washington. Users will be able to browse local wineries that are located within an approximate driving distance of 40 miles from the Tri-Cities, they will be able to create a wine visitation itinerary that is configurable from a browsable and sortable winery listing, and they will be able to maintain and customize a wine journal that can then be used for referential purposes in order to keep track of previously tasted wines. Furthermore, from the information put into their wine journals, users can optionally share their own wine ratings, and browse the reviews submitted from other users. Some aspects of the application will be for users' personal use, such as tasting notes and itineraries, while others will be shareable, such as wine reviews and winery comments. Additionally, some features will be fully accessible to users without logging in, such as acquiring information about the wineries and reading reviews, but a login will be required for more advanced features like commenting or accessing the planner and journal components.

There are numerous informational websites that concern wine-making and wine-tasting from a general perspective, such as *winefolly.com*, wine purchasing platforms, such as *wine.com*, or wine rating forums and applications, such as *wines.com* and the android/iOS app *Delectable*, but nothing to my knowledge exists specifically for the Tri-Cities wine community. Where my web application idea truly excels is in its understanding and execution of the whole wine tasting process with an integral focus on the Tri-Cities wine region itself. Wine novices and devout enthusiasts alike, from local novices to touring aficionados, will be able to refer to *Tri-Cities Wine Hub* for all of their respective wine hobbyist needs in this region.

1.3. Learning Goals

In Kate Ganiukova's article "What is a Full Stack Developer in 2018 and How Do I Become One", she thoughtfully and systematically lays out the skills, from HTML and CSS on the frontend to database and multi-language fluency on the backend, that are not only in high demand for web development jobs in this day and age but are also becoming increasingly necessary.¹ I fully understand that in "real-world" scenarios, when large development firms take on large projects, most web development tasks are compartmentalized and delegated to specific team members who specialize in particular areas. This approach promotes efficiency. Designers design and may never have to use anything more than Photoshop or Illustrator. Frontend developers deal strictly with client-side development and make sure all of the HTML and CSS assets are semantically optimized. There are even individuals who specialize in marketing, social media, SEO (Search Engine Optimization) integration, or database architecture. When I began the Digital Media Design program at Harvard, however, all I knew was that I wanted to make impactful websites, learn whatever I could, and eventually apply those skills in whatever capacity I could within the realm of web design and development.

For my capstone I want to purposefully synthesize the classes I have taken throughout this diverse Digital Media Design program and apply them to one focused but well-rounded project. I want to pay equal attention to the user interface, frontend development, information architecture, database design, and backend development while I further strengthen my understanding of languages like PHP and client-side JavaScript. *Tri-Cities Wine Hub* will only be in its infancy when the semester concludes, as time will permit me to do only so much, but all of these areas will at least be synergized into a focused design and final implementation. In the end, I'm sure I will come to appreciate how all of these elements of web development and design come together as I learn what particular areas I have a proclivity for and, hopefully during the process, strengthen my weaknesses. I look forward to having the opportunity to dig deeper into the diverse areas I've covered through my coursework as I create a web application that is not only more complex than anything I have ever done before but is also built from the ground up.

1.4. Target Audience

Firstly, it is important to address the significance of the wine industry both in Washington state as a whole and the Tri-Cities area specifically, as many people outside of this region are unaware of just how important the Tri-Cities is to the wine industry in the United States or the multitudes of people who visit our region's wineries or consume its wines.

According to the Washington State Wine Commission, wine tourism generates approximately 4.8 billion dollars in total economic impact throughout the state of Washington and has become the second largest producer of wine in the US.² Furthermore,

¹ Ganiukova, Kate. *What is a Full Stack Developer in 2018 and How to Become One*. Retrieved from <https://hackernoon.com/what-is-a-full-stack-developer-in-2018-and-how-to-become-one-ca82e8906c87>

² Washington State Wine Commission. *Washington State Wine Fast Facts*. Retrieved from <https://www.washingtonwine.org/wine/facts-and-stats/state-facts>

in Benton County, where the Tri-Cities is the county's predominant metro area with an urban population of over 250,000 people, local wineries "produced just under 9.5 million cases of wine in 2014", which is the most in any Washington county by over 7 million cases.³ Moreover, *Visit Tri-Cities* claims that over 99% of the grapes used for wine-making in Washington state come from the Columbia Valley AVA, which not only encompasses the entirety of the Tri-Cities, but swathes of surrounding rural areas in adjacent counties. There are several other notable American Viticultural Areas near the Tri-Cities as well.

Although it is difficult to ascertain how many wine tourists, consisting of both local wine enthusiasts and visiting tourists, frequent Tri-Cities wineries, it is safe to say that unique visitors can be accounted for in the tens of thousands on an annual basis. The Tri-Cities Wine Society, which hosts the annual Tri-Cities Wine Festival, states that there were over 1000 visitors in attendance at the festival's Gala Tasting just last year.⁴ Keeping in mind that this is just a singular wine-tasting event and that there are numerous others in any given year, such as the spring barrel tasting held annually every April throughout the region, suffice it to say that *Tri-Cities Wine Hub* could potentially have a broad and compelling appeal. *Tri-Cities Wine Hub* will draw much of its user-base from the region's wine enthusiasts, ranging from novices to bona fide connoisseurs, who regularly participate in wine-tasting events and visit the 200 tasting rooms that this area offers.

There are three kinds of users that *Tri-Cities Wine Hub* can cater to, and each category of user has specific needs that may or may not overlap the needs of other users.

User 1: Wine Novice

This kind of user is a person who is either starting out in the wine-tasting hobby or is still in the process of acquiring information and learning about it. The user may not even be aware that the Tri-Cities area has so many wineries and tasting rooms that offer a wine-tasting and touring experience. The user might just want to browse information without putting effort into creating an account, reviewing wines, or participating in a forum of any kind. For these reasons, certain parts of *Tri-Cities Wine Hub* will always be accessible without a login account, such as the Winery Guide or AVA Map features, which will allow users to search for and read up on the local wineries. They won't be able to interact with the information, such as favorite a winery or add comments, but at least they can view the pertinent information. Users in this category might also just want to purchase a wine for an event, like a wedding or birthday party, and *Tri-Cities Wine Hub's* community-generated wine reviews will be accessible and searchable.

User 2: Local Wine Enthusiast

This category of user regularly enjoys wine and always looks forward to the opportunity to go wine-tasting and tour the local region. They may not venture far, but at least they get out to the wineries on occasion. In this case, the user might want more dynamic features, such

³ Washington State Wine Commission. *Economic and Fiscal Impacts of Wine & Wine Grapes in Washington State*. Retrieved from <https://www.washingtonwine.org/>.

⁴ Retrieved from www.tricitieswinesociety.com.

as the ability to plan an itinerary or keep track of previously tasted wines. A certain amount of time may have passed to where they can't remember what wines they really enjoyed or what winery they went to last. The Wine Journal and Planner features of *Tri-Cities Wine Hub* will certainly satisfy these users' needs, but a login and password will be required.

User 3: Avid Wine Tourist & Reviewer

This user category is filled with the kinds of wine enthusiasts who live, sleep and breathe wine. They go on wine tours regularly, have filled their cellars with too many bottles of wine to count, and get calls from friends and family members asking them what wine should be paired with what entrée. I doubt any information contained on *Tri-Cities Wine Hub* would teach these users anything they haven't heard of before. Maybe they've even exhausted the hundreds of tasting rooms in Washington state. However, every community needs their leaders, and these are the types of users who would review the most wines, give informative winery comments, and actively give suggestions to the web admin (namely, me) for the inclusion of lesser known wineries.

1.5. Elevator Pitch

Tri-Cities Wine Hub has significant potential to impact the wine tourism and tasting industry in the Tri-Cities by becoming a community platform for wine enthusiasts of all experiences who already actively participate in or want to participate in this region's wine tasting. Although there are many wine tasting applications that Tri-Cities wine enthusiasts can use, and there are easily accessible resources that provide information about the region's wines and wineries, nothing truly exists as a "hub" to bring all these elements together for this specific wine region in a simplified, cohesive, accessible and feature-rich application. By utilizing a streamlined user interface, *Tri-Cities Wine Hub* can be the go-to website application for both local and visiting wine tourists who prefer to have all of these application features and informational resources in one manageable website. By creating synergy from my coursework at Harvard, from backend application development to frontend design, I can bring this project to fruition.

1.6. Metrics

I had originally outlined three levels of success for *Tri-Cities Wine Hub* where each level corresponded to the functionality and integration of the features I have planned for the finalized version of the application. However, I have scratched that idea in favor of aiming toward certain quantifiable measures of success with my timeline based around the completion of the capstone. The deadline and time limitation are fairly obvious – the end of the semester – but these metrics will keep me on track throughout the semester as I sequentially integrate the various components of the application.

Firstly, from a technical standpoint, all HTML and CSS must validate. That means 0 errors (unless they are associated with the front-end framework and not my own code). HTML error checks will be conducted at <https://validator.w3.org/nu/> and CSS tests at <https://jigsaw.w3.org/css-validator/>. As I buildup the frontend of the site, I will repeatedly conduct the tests and correct any resulting errors.

Secondly, all form inputs must validate properly. I will encourage all test users to input as much garbage as they can think of and try to break the forms (like putting numbers where only letters should go, or inputting a 20-character long phone numbers, or a 500-character string of code for a name field). Again, I want 100% validation.

Lastly, from the technical side of things, the server must load each webpage in less than 3 seconds. This will ensure that my database tables are being queried properly and without redundancy and my backend processes are optimized. Ultimately, this kind optimization will greatly benefit the users as well.

Most importantly, for more user-focused metrics, I will have a survey adapted from the Website Usability Scale (WUS) accessible on *Tri-Cities Wine Hub* during the usability testing phase. This is a standardized scale that gauges how user-friendly a website is based on ten simple questions and the aggregate score of the users' responses (either strongly disagree, disagree, neutral, agree or strongly agree). A score of 100 is supposed to mean that the website is fully usable while the average website score is 72.⁵ My goal will be to have an aggregate score of 90 or greater from my usability testers.

WUS Questions⁵

1. I think that I would like to use this website frequently
2. I found the website unnecessarily complex
3. I thought the website was easy to use
4. I think that I would need the support of somebody technical to be able to use this website
5. I found the various functions in the website were well integrated
6. I thought there was too much inconsistency on this website
7. I imagine that most people would learn to use this website very quickly
8. I found the website very awkward to use
9. I felt very confident using the website
10. I needed to learn a lot of things before I could get going with this website

1.7. Life of the Project Beyond Capstone

My initial goal while developing this idea for my capstone was to create a wine enthusiast web application for the whole of Southeastern Washington and Northeastern Oregon, including the Yakima Valley and Walla Walla wine regions, which alone comprise several

⁵ What Users Do. *What is the WUS Scale?* Retrieved from <https://www.whatusersdo.com/what-website-usability-scale>

hundreds of wineries. However, while that initial aim was perhaps overly ambitious, it is not so unfortunate that I eventually chose the Tri-Cities, my hometown, to be the start, the ground zero if you will, for something that might grow even bigger. I will undoubtedly be able to expand the scope of this application beyond the Tri-Cities if and when the time comes. I truly hope that when I finish *Tri-Cities Wine Hub* and fulfill my capstone – after each project deadline has passed and each milestone accomplished – that its life has only just begun. I have already lined up an extensive, though tentative, list of potential features that will create an even richer experience for users (refer to section 6) and the groundwork will already be laid out to execute those plans. I have discussed my capstone plans with my friends and family, many of whom are avid wine enthusiasts, and they are quite excited for this project as well.

From a more pragmatic and career-focused perspective, I'm planning on using this capstone as part of my portfolio for procuring future work in the web design and development field. I have always paid attention to and admired the quality of the websites that many of these local wineries have and maybe this capstone will garner some attention for me. Nevertheless, this capstone will at least set me on the path of becoming the full stack developer I'm striving to be, which was my motivation to enter the Digital Media Design program in the first place. I certainly need to acquire a lot of hands-on experience in the years ahead, but in the meantime, I look forward to applying and synthesizing the skills I've learned during my coursework to make *Tri-Cities Wine Hub* as successful as possible.

2. Competitor Review

2.1. Visit Walla Walla

Walla Walla is a city located a little over an hour's drive east of the Tri-Cities in an adjacent county and, much like the Tri-Cities (though with a fraction of the population), it is a notable wine-growing and wine-touring region in Washington state. Although *Visit Walla Walla*'s website (<http://www.wallawalla.org/>) is broadly marketed to Walla Walla tourists and covers a wide-range of city activities and general things to do, there is a section on the website (<http://www.wallawalla.org/wineries>) that specifically addresses the wine industry and local wineries. The primary component of the "Wineries" section on the website is a sorting feature that generates a Walla Walla winery list. The various kinds of information, such as the winery address, contact information, and winery website link are similar to what will be implemented with *Tri-Cities Wine Hub*. Additionally, a photograph of the winery is provided.

Start Searching Here

All Locations ▾ All Varietals ▾ All Tasting Days ▾

Your current search: *All wineries*



21 Grams

Visit Website

(541) 203-0020

3796 B Peppers Bridge Rd, Walla Walla, WA 99362



KEEP IT



MAP IT



Abeja

Visit Website

(509) 526-7400

2014 Mill Creek Rd, Walla Walla, WA 99362



KEEP IT



MAP IT



Adamant Cellars

Visit Website

(509) 529-4161

525 E Cessna Ave, Walla Walla, WA 99362



KEEP IT



MAP IT

Bergevin Lane Vineyards

• Phone: (509) 526-4300

• [Visit Website](#)

• Address: 1215 W Poplar St, Walla Walla, WA 99362

• Hours: Mon – Thursday 11 AM – 4:30 PM, Fri 11 AM – 6 PM, Sat 11 AM – 5 PM

• Wine Region: Westside

• Varietals: **Reds:** Blends, Cabernet Franc, Cabernet Sauvignon, Malbec, Merlot, Petit Verdot, Syrah, **Whites:** Sauvignon Blanc, Viognier

• Tasting Fee: Yes



Bergevin Lane is located in town and has been creating critically acclaimed wines for over a decade. Owned and managed by Annette Bergevin, Gary Bergevin and Amber Lane, the winery offers an intimate and fun tasting experience for all those who enjoy wine. Come down and visit the winery when you are in town!



KEEP IT



MAP IT

Figure 1. Screenshots of *Visit Walla Walla's* sortable winery list feature (left) and detailed winery view (right).

When the user clicks on a specific winery from the sorted list, they are presented with a detailed view that reveals more information about the winery and a brief abstract. Furthermore, in both the listed and detail views, users have two buttons to choose to click on: “Keep It” and “Map It”. If the user clicks on “Map It”, he or she is sent to an external google maps site where the location of the winery is generated on a map and directions are given when the user inputs the starting location. If the user chooses “Keep It”, however, then that winery is added to the user’s “Trip Planner Suitcase”, which sequentially compiles all of the other wineries that the user has added into an itemized list. The user can then print the page as an itinerary for visiting the various wineries that were initially selected. This information is not saved to a database, however, and will eventually be removed when the browser is closed, thus expiring the browser session. Contrasting *Visit Walla Walla's* implementation of a winery planning feature, *Tri-Cities Wine Hub* will actually have a database that stores user information and will only be removed only if the user chooses to do so.

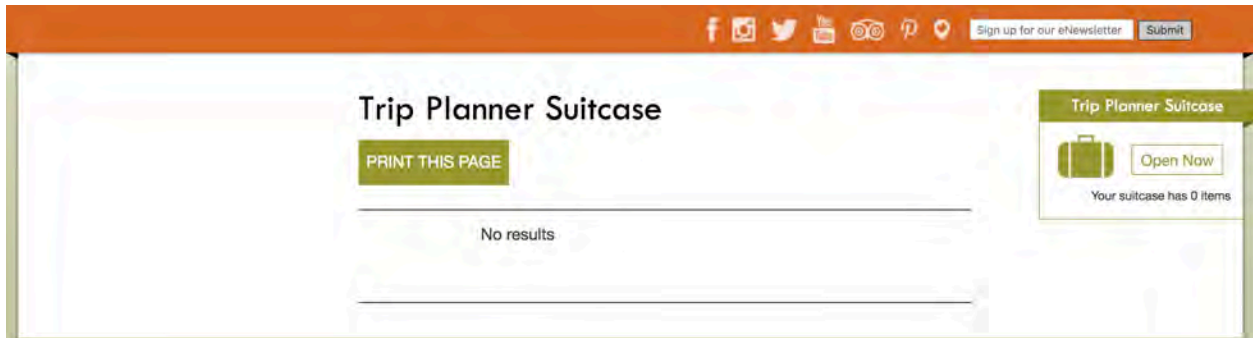


Figure 2. Screenshot of *Visit Walla Walla*'s "Trip Planner Suitcase" feature.

Visit Walla Walla's winery search feature coupled with the "Suitcase" and mapping feature are quite similar to the winery guide and planner that I'm proposing to make with *Tri-Cities Wine Hub*. As opposed to their website, however, my application will actually have a to-do list type feature where the itinerary can be customized from a compiled wish-list of wineries and those wineries can then be dynamically crossed-off by the user. Moreover, a *Tri-Cities Wine Hub* user may favorite, like and comment on the wineries from the wineries guide, which is not available on this competitor's website. The sorting feature that *Visit Walla Walla* implements is quite notable and their execution of it, along with the kinds of information they provide concerning the specific wineries, is absolutely in line with my plans for *Tri-Cities Wine Hub* – I just plan to take things a step further. There is currently no login feature either, as *Visit Walla Walla* relies only on session cookies without the use of a user database.

2.2. Walla Walla Mobile Wine Tour App

Visit Walla Walla has a link to a mobile app, provided by *Mobile Wine Tour*, that has a more streamlined user interface for searching through the wineries list by name (alphabetically), associated wines, hours of operation, or, via a personal digital device's GPS, the nearest wineries according to the user's current location. The winery information provided by the app seems to contain the same content as *Visit Walla Walla*'s website, so I can only assume that the database information has been shared between the two.

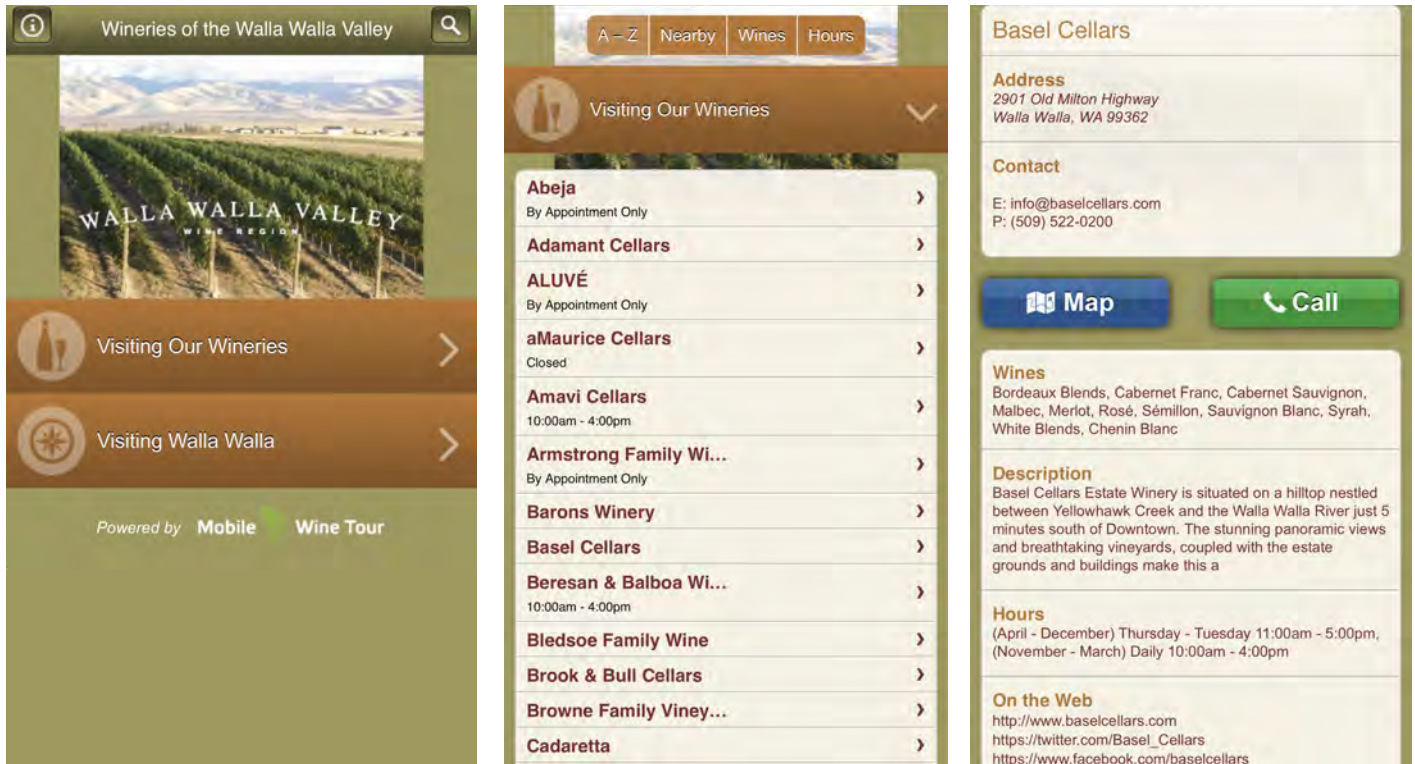


Figure 3. Screenshots of the *Mobile Wine Tour* app (wallawalla.mobilewinetour.com) that uses database information provided by *Visit Walla Walla*. From left to right: the app's main home page, the Visit Our Wineries page (with wineries listed alphabetically), and, on the far right, a detailed view of a winery showing the Map and Call buttons.

In the detailed view of the winery (after the user clicks on a winery from the listing), there are two clickable buttons that are emphasized, one is labeled “Map” while the other is “Call”. When the user clicks on the map button, directions are displayed on a google map (Google’s API was integrated into the application). When a user clicks “Call”, his or her phone automatically dials the winery. These are two very interesting features, particularly as they pertain to mobile devices, because people who venture out wine tasting can explore what’s around them and get immediate directions or call the winery directly with questions.

2.3. Untappd

Untappd has both a mobile app and a traditional website, but for the purposes of this review I will be referring to the actual website (www.untappd.com), which also happens to be mobile responsive. *Untappd* is, at its core, a rating and reviewing application for beer and breweries with some interesting social media and forum features. The website has an account feature and user database, similar to what I plan on implementing in *Tri-Cities Wine Hub*, where users create and maintain an account in order to participate and review. Unlike *Tri-Cities Wine Hub*, however, *Untappd’s* user-base must have accounts or they will not be able to view any part of the site.

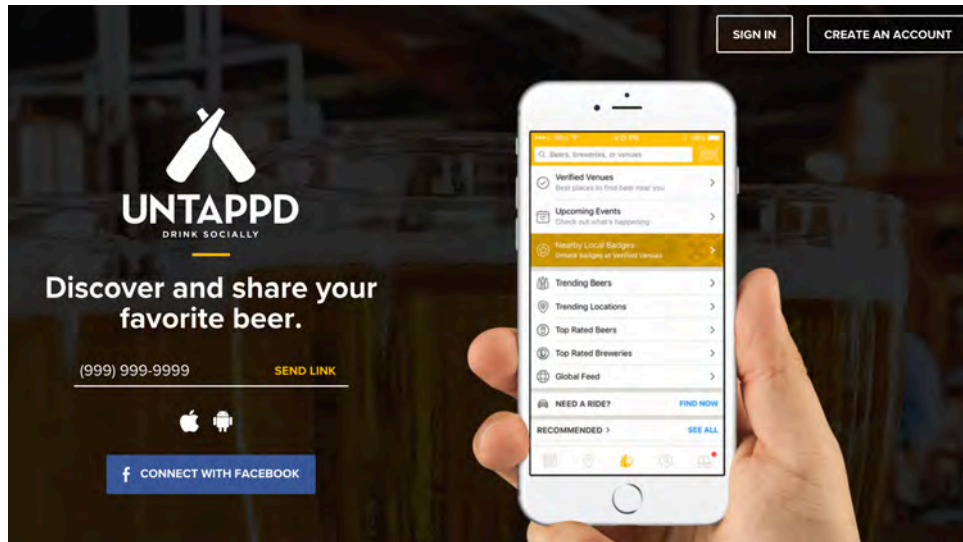


Figure 4. Screenshot of *Untappd's* home page. Visitors to the site who do not have a user account or are not already logged in are greeted with this screen.

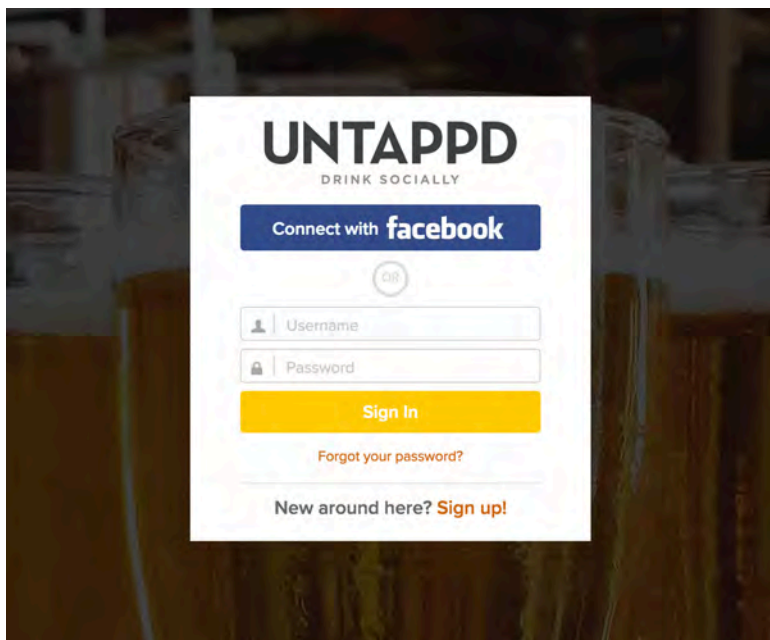


Figure 5. Screenshot of *Untappd's* sign in screen that pops up after the user clicks "Sign In" from the previous page.

Although *Untappd* encompasses a much broader scope (*Tri-Cities Wine Hub* focuses on one particular wine region) and a plethora of complex and interwoven social media features, the website shares aspects with *Tri-Cities Wine Hub* from a login and user experience perspective. After logging in or initially signing up, *Untappd* users are directed to their unique profile home page that displays lists of data that is exclusive to them. While on any other page on the website, the navigation bar has an icon that, when hovered over, reveals a list of user-related options.

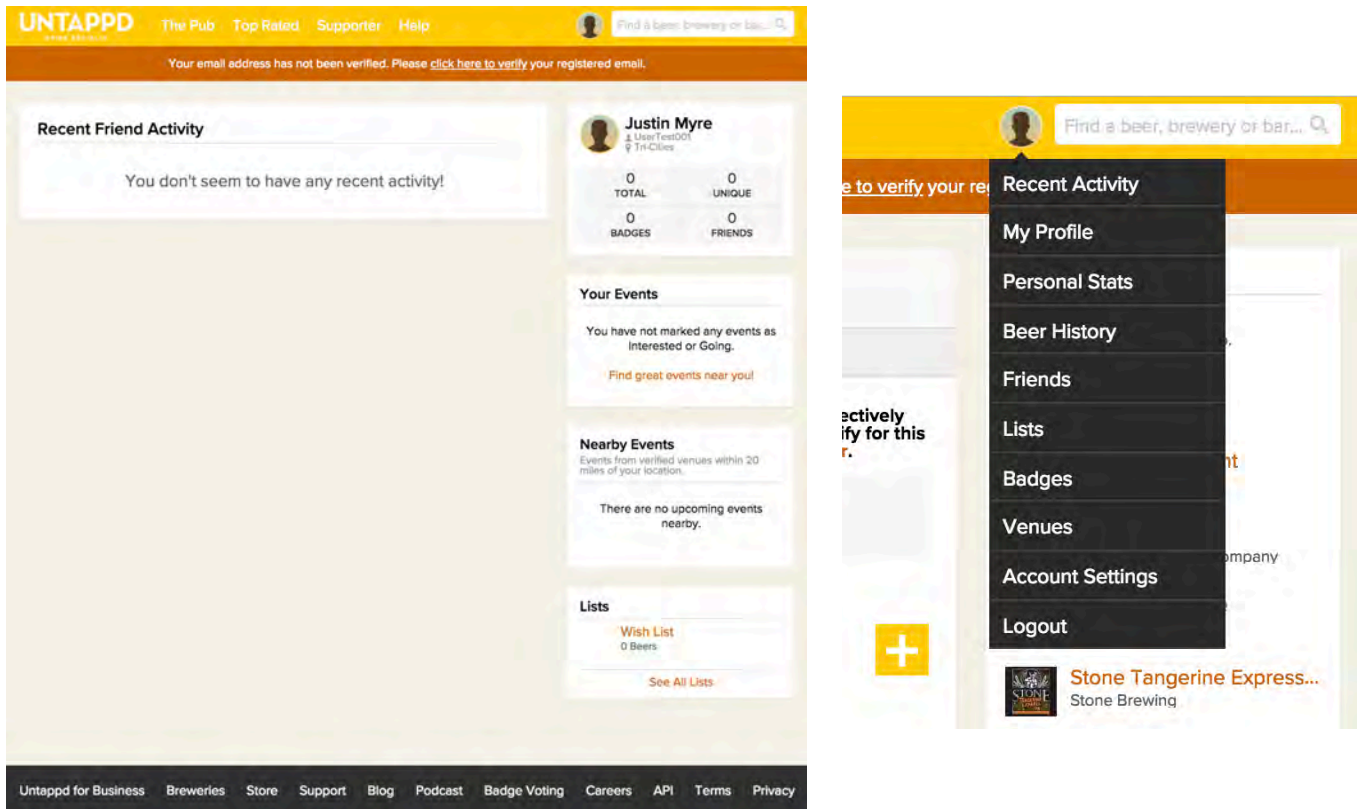


Figure 6. Screenshots of *Untappd*'s home page after logging in (left) and the dropdown of listed user options when the navigation bar's icon is hovered over while the browser is not on the home page (right).

The rating features found on Untappd could more closely be compared to the Wine Reviews feature on *Tri-Cities Wine Hub*. With *Tri-Cities Wine Hub*, however, the focus is more on the regional wine tasting experience in conjunction with the wineries themselves, whereas *Untappd* just compiles user reviews and relays the rating statistics of the many beers found on the site. *Untappd*'s user interface is streamlined and friendly but places more emphasis on the internet-communal aspect of rating and reviewing beer and less on the local beer-tasting experience. In other words, it has a lot of social media features, which is certainly not a bad thing, but it can create a less intimate experience until the user has enough friends to share their interests with.

2.4 Wine Tripper (Washington State Edition) Mobile App

The *Wine Tripper* app, which is available on both iOS and android, has several interesting features that share similarities with my plans for *Tri-Cities Wine Hub*. Most notably is the Wine section, where users can add individual wines, including information like the cost of a bottle, the varietal, and the winery that the wine comes from, which is then all stored in their account in a listed format for future reference. Furthermore, users can optionally favorite particular wines they add and write down their tasting notes.

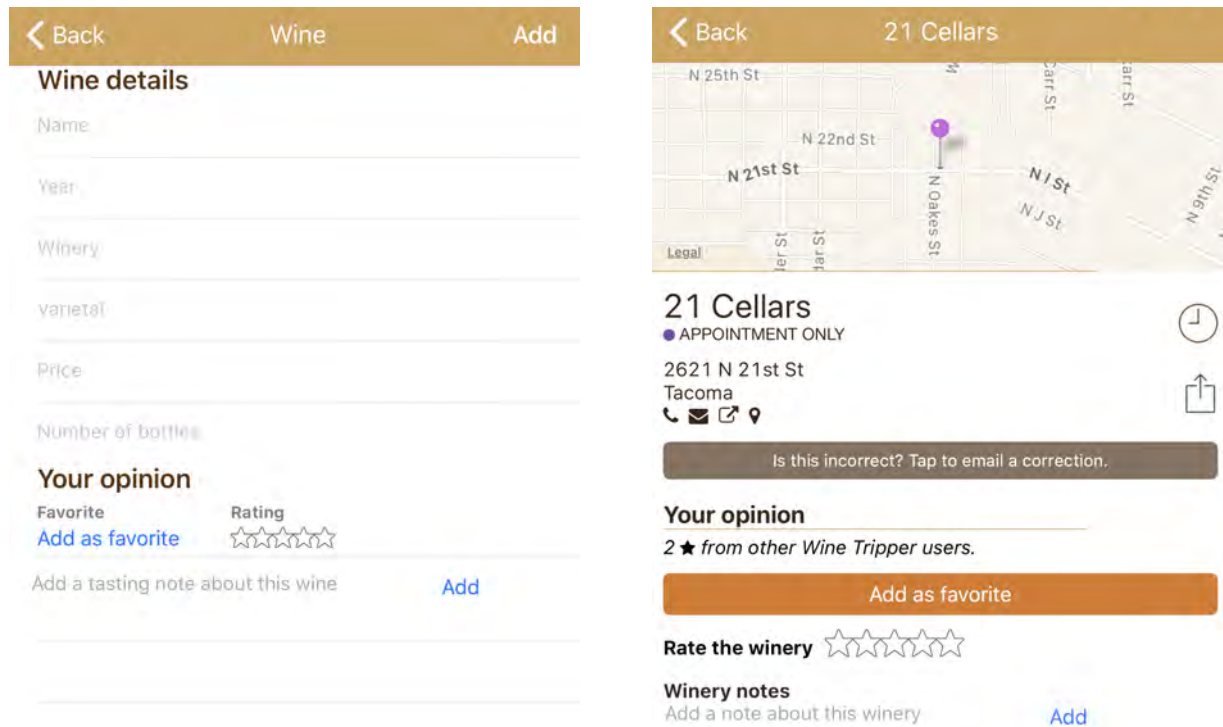


Figure 7. Screenshots of *Wine Tripper's* Wine feature (left), which is similar to what I have planned for *Tri-Cities Wine Hub's* Wine Journal feature, and a detail view of a selected Winery (right).

The winery listing is similar to other competitor websites I have reviewed, like *Visit Walla Walla*, but there are more options available to the user in the detail view of a winery when it is selected. Firstly, a map is shown at the top which indicates where the winery is located, thus providing great directional reference for the user. Moreover, users can rate the winery, add a comment, favorite it and even send an email correction if any of the winery's information, such as its tasting hours, have changed since they were last put in or are altogether incorrect. All of this information is again stored and is made available to other users. Overall, the app adds a lot more functionality than some of the other wine-focused applications I have previously reviewed.

3. Technology Requirements

3.1. Web Design/User Interface: Sketch and Adobe Photoshop

Although my main focus with this capstone will be frontend and backend development and the interplay between the two, there are a lot of features I have planned for *Tri-Cities Wine Hub* that will depend on a good user interface and cohesive design. I feel that starting with an un-coded initial design of *Tri-Cities Wine Hub* will be vital for whether or not it succeeds when the backend is fully functioning or even before I begin coding. Although I wanted to take Jen Kramer's Planning Successful Websites and Applications course, unfortunately, I did not, but I did take DGMD E-50 Visual Communications and learned a bit of the importance of thoughtful design in Kramer's other courses as well.

I am in no way, shape or form a graphic designer of any kind but I have become fairly experienced with Photoshop and, at the very least, have an understanding and appreciation for what good design truly is. I have also recently been learning a program called Sketch, which is a mac-only piece of software that was created entirely with web designers in mind. Throughout this summer I have been working my way through video tutorials provided by Mike Locke, a UI/UX designer, at his website, <http://mlwebco.com/>, where I have been learning how to use Sketch effectively before any HTML or CSS is implemented. A fully functioning mock-up isn't necessary for this capstone, as my concentration won't necessarily be on UI/UX design, but I will have the frontend look of the website laid out with Sketch before I begin the actual coding (some rough Sketch drafts are even included throughout this tutorial) and the final files, exported to jpeg images for compatibility purposes, will be part of my deliverables for the capstone.

3.2. Frontend Technologies

3.2.1. UIKit, SASS Customization

A good front-end framework can really cut down on the time it takes to hand-code HTML and CSS and gives a front-end developer pre-made CSS classes to use quickly and effectively.⁶ Twitter's Bootstrap currently seems to be the go-to front-end framework for developers as most sites I come across tend to implement it in some way or another. I debated between just using Bootstrap, just like everyone else seems to, or the lesser known but equally responsive and user-friendly UIKit. I used Bootstrap in both my application development classes (CSCI E-15 Dynamic Web Applications and CSCI E-31 Web Application Development using NodeJS) but became most familiar with it in Jen Kramer's Content Management Systems class (DGMD E-25). While taking Kramer's Modern & Mobile Front-End Design II, however, I was introduced to UIKit and grew quite fond of it. I learned how to customize UIKit's prebuilt themes by using SASS (Syntactically Awesome Style Sheets) and that is the approach I will be taking with this capstone.

⁶ Schlesselman, Derek. *Pros & Cons of Frontend Frameworks*. Retrieved from <https://envisionitagency.com/blog/2018/04/pros-cons-front-end-web-frameworks/>

UIkit provides great off-the-shelf capability, browser compatibility and a mobile responsive grid system, while also integrating google fonts and custom icons and having a smaller overall foot-print than Bootstrap.⁷ I will be manipulating the raw SASS files to customize UIkit's default styling, such as the color palate, custom buttons, and forms, but as a basic framework that utilizes a grid system, UIkit will allow me to get *Tri-Cities Wine Hub* mobile responsive and professional-looking quite quickly. Some features I will take advantage of are the Switcher Component, Form Component, and the Off-Canvas component for mobile navigation. Most of the iconography that will be used in *Tri-Cities Wine Hub*, such as the user and mobile menu icons, will come prepackaged with UIkit which drastically reduces my design time and eliminates the need to import glyph icons from somewhere else.

3.2.2. Client-side JavaScript/jQuery

Many of the user interface elements of *Tri-Cities Wine Hub* will require the use of JavaScript/jQuery event handlers to hide and show parts of a form and make transitions between what the user sees or doesn't see. Basic DOM (Document Object Model) manipulation may also be necessary to achieve certain tasks. Form inputs will not only be validated through the backend, but also client-side validation will be implemented through a jQuery Validation plugin from <http://www.jqueryvalidation.org/>. At this point, I don't imagine using Javascript with much complexity for this particular project, and I shouldn't have to go far beyond what I covered in CSCI E-3 Web Programming/Intro to JavaScript. It should just be a matter of applying what I already know.

3.3. Backend Technologies

3.3.1. MVC (Model View Controller) Framework: Laravel 5.5

After weighing all of my options, I have chosen to use Laravel 5.5 and utilize Model View Controller architecture for the backend development of the application. I acquired initial experience with a previous iteration of Laravel in Susan Buck's CSCI E-15 Dynamic Web Applications, the notes from which I will surely refer to throughout the building of this Laravel application. There are a few new features that I look forward to using in this version of Laravel, such as improved and simplified custom validations rules, which is great for me considering how many forms and user inputs *Tri-Cities Wine Hub* will ultimately have, and new Blade directives for simpler user authentication (useful for the login component of *Tri-Cities Wine Hub*).⁸ Laravel 5.5 also requires the use of PHP 7 and my previous experience is with PHP 5. I purchased a thorough and comprehensive reference book, *The Laravel Companion: A Guide to Helpers, Collections, and More*, written by Jonathon Koster, which will provide me with exhaustive amounts of material for updated Laravel reference, though Laravel's documentation is already adequate in most cases.

⁷ Sivokon, Eugene. *Why UIkit is better than Twitter Bootstrap*. Retrieved from <https://www.eugenesivokon.com/blog/why-uikit-is-better-than-twitter-bootstrap>

⁸ Laravel News. *Laravel 5.5 LTS*. Retrieved from <https://laravel-news.com/category/laravel-5.5>.

3.3.2. Digital Ocean

I will use Digital Ocean for the server and web host for *Tri-Cities Wine Hub* and the application will run on what is call a “droplet”. I have grown quite accustomed to using Digital Ocean from Buck’s course and I’m already familiar with how things are pushed to Github from my local server and then pulled into Digital Ocean. It is secure, fast, reliable and fully compatible with the LAMP stack and the newest version of Php.

3.3.3. LAMP Stack (Linux, Apache, MySQL, PHP)

Although I took a course on the MEAN (MongoDB, Express, Angular Node) stack, CSCI E-31 Web Application Development using NodeJS, I have chosen to use a LAMP stack in conjunction with Laravel as the MVC framework for *Tri-Cities Wine Hub* because, well, I want to. I found the Laravel documentation more thorough and comprehensible than what is available for Express (Laracasts are awesome), I like the default blade templating language that Laravel uses over something like Pug for Express, and I even like how picky Laravel is with its directory structure and naming of things as opposed to the lawlessness of node and express. So, if I want to use Laravel, that essentially means that I’ll be using a LAMP stack.

Well, that’s not entirely accurate. What I learned is that I could use a Mongo database with Laravel if I really wanted to. Mongo is a cloud-based database that isn’t nearly as confined as SQL is because it doesn’t rely on relational tables, and, due to the popularity of the MEAN stack, has become quite popular.⁹ However, after weighing the pros and cons, I don’t think *Tri-Cities Wine Hub* would benefit from overcomplicating things by using MongoDB. Laravel is really setup for MySQL and I don’t really need a cloud-based system.

3.4. Version Control: Github

I will be taking advantage of version control as I progress through the building of my application. I am very familiar with GIT, having used it with Github for both my applications classes, and I will continue to use Github. The repository I use will be updated at least weekly and will eventually be part of the deliverables for the capstone.

3.5. Why an MVC framework and not a CMS?

Even though I have somewhat of a bias for Laravel because of my familiarity with its documentation, directory structure, and just how elegantly everything works together, I did initially want to use WordPress, which is the content management system I am most fond of and experienced with after having taken Jen Kramer’s CMS class. The only problem is that the more I thought of how to construct this application by using a CMS like WordPress, I stumbled into several clunky issues. With a CMS, you have to hack so many plugins just to get them to do what you want. Furthermore, from my research into

⁹ Wayner, Peter. *MEAN vs LAMP for Your Next Programming Project*. Retrieved from <https://www.infoworld.com/article/2937159/javascript/mean-vs-lamp-for-your-next-programming-project.html>

WordPress, I read a lot about how the slowdown on WordPress sites is most often due to an inefficiency in querying the SQL database because so much extraneous coding and redundancy has been implemented. When I stumbled upon an article by Vladimir Kazankov entitled *Wordpress vs Laravel*, I read how several developers resolved the slowdown of their sites and applications by transferring them from WordPress to an MVC framework like Laravel and just doing a bunch of the coding from scratch.¹⁰

In the end, even if I never use Laravel after this capstone, the benefits of building something from the ground up with a framework like this will allow me to develop my programming skills and become a more effective developer. I will probably use WordPress quite a bit for future website development, but I understand its limitations and know that it's just a hackable blog for content-heavy sites, not feature-driven applications.

3.6. Summary of Relevant Coursework

- CSCI E-3 Web Programming/Intro to JavaScript
- CSCI E-12 Website Development
- CSCI E-15 Dynamic Web Applications
- CSCI E-31 Web Application Development using NodeJS
- DGMD E-20 Modern & Mobile Front-End Design I
- DGMD E-25 Content Management Systems
- DGMD E-27 Modern & Mobile Front-End Design II
- DGMD E-50 Visual Communication Design

4. Design Workflow

4.1. Web Application Overview

Firstly, when users visit *Tri-Cities Wine Hub* what they experience will be “served” to them via a Digital Ocean droplet. The domain name, www.tricitywinehub.com, which was purchased and acquired at Namecheap.com, will be allocated to that droplet, which by default has already been assigned an IP address. Digital Ocean itself will be running a freshly installed, fully updated LAMP stack (Linux, Apache, MySQL, and PHP) with Ubuntu, which is based on the Linux kernel, as the operating system, Apache as the webserver, MySQL as the database, and PHP 7 as the object-oriented programming language. As *Tri-Cities Wine Hub* will be utilizing the Laravel framework, Composer will be installed on Digital Ocean and used for the dependency management. It is through Composer that various Laravel dependencies (mini-programs and bits of regularly updated code) can be properly installed on Digital Ocean and allow Laravel to function smoothly with all necessary required packages and updates.

¹⁰ Kazankov, Vladimir. *Wordpress vs Laravel*. Retrieved from <https://belitsoft.com/laravel-development-services/cms-or-framework-wordpress-or-laravel>

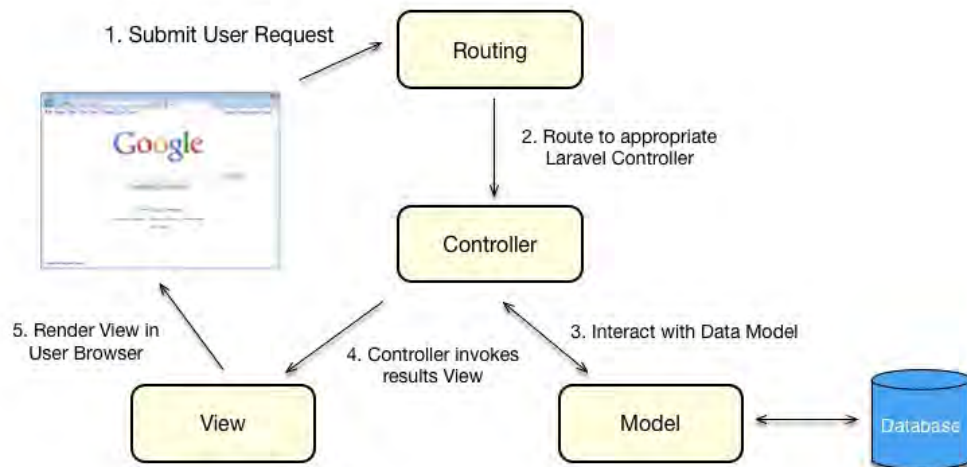


Figure 8. A Flow Chart demonstrating how MVC architecture works. In the context of *Tri-Cities Wine Hub*, this will be achieved by using a combination of Laravel with the LAMP stack on Digital Ocean. Retrieved from <http://grigorov.website/blog/how-to-organize-your-project-with-php-and-laravel-to-get-the-best-structure-in-mvc-pattern>

Laravel utilizes Model View Controller architecture, which essentially means that the client-side interface (i.e. what the user sees and interacts with) and relevant data is dynamically generated on a single page as opposed to static html sites that deliver unique pages to the user that correlate to whatever urls (ie web addresses) are used. The dynamic features are achieved by utilizing Laravel’s routes (where do we go now?), controller logic (what do we do now once we’re here?), models (how do we store/deliver data?) and views (what does the user see now?).

When a user visits the website and searches for wineries in the Winery Guide section, for example, what they ultimately see on the page after submitting the search criteria is determined by what Laravel's router and controller figure out for the user. When the user hits the Search button, Laravel’s route will utilize a GET request that will then refer to a specific controller function. That controller function will extract the query data from the search request, interact with the model that updates the MySQL database, and then the controller function will return a specific view (in the Blade template language) that dynamically fills in the relevant data from the database. The frontend user interface, as mentioned previously in section 3, will be wrapped within UIKit, a frontend framework, which will use pre-built CSS classes to display the updated information in a tidy, pre-organized and styled format that is mobile responsive and accessible.

4.2 Winery Guide

The Winery Guide listing feature will enable users to easily search for wineries and browse pertinent information such as tasting times, addresses and websites. Users will be able to search for wineries via certain criteria by selecting a particular city and choosing whether the wineries should be sorted alphabetically, by the most favorited, or by their highest aggregate wine rating score. Users will also be able to comment on the wineries, add them to their favorites, read the wine reviews, or click on an external link that sends them to the winery's website. These features will be discussed later.

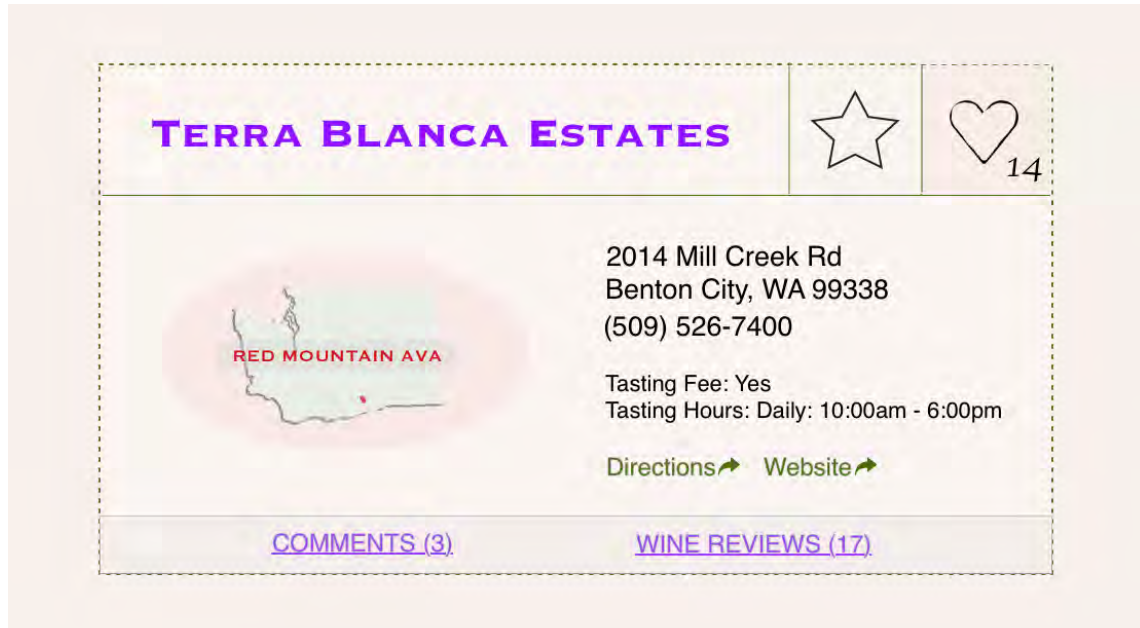


Figure 9. A Sketch design (rough draft) that I created which demonstrates the detail view of a winery listed in the Winery Guide. Several items, like the star and heart, are buttons that add functionality.

Although such a list of wineries could be fairly exhaustive (there are over 200 in this region alone), I will compile the list myself with an initial aim of around 50 or so. That means that I will actually be verifying tasting fees, tasting hours, and everything else either by phone or online and then compiling that data. Thanks to my perusing of Rebecca Doris' sample proposal, I was able to come across a reference she made to Sam Deering's article, *Laravel 5: Load Seed Data From JSON*, and after reading it I decided that I could easily just catalog the winery data into a JSON file and seed it into the wineries table of the MySQL database. The only stipulation is that the format must mimic Laravel's migration of that table. The following code demonstrates what this JSON list may look like with two example wineries.

```
[
  {
    "id": "1",
    "winery": "Terra Blanca Estates Winery",
    "street": "34715 Demoss Rd",
```

```

    "city": "Benton City",
    "state": "WA",
    "zip": 99320,
    "phone": "509.588.6082",
    "AVA": "Red Mountain",
    "website_url": "http://www.terrablanca.com/",
    "favorites": 0,
    "tasting_fee": "Yes",
    "tasting_hours": "Daily: 10:00am to 6:00pm"
  },
  {
    "id": "2",
    "winery": "Airfield Estates Winery",
    "street": "560 Merlot Drive",
    "city": "Prosser",
    "state": "WA",
    "zip": 99350,
    "phone": "509.588.6082",
    "AVA": "Yakima Valley",
    "website_url": "http://www.airfieldwines.com/",
    "favorites": 0,
    "tasting_fee": "Yes",
    "tasting_hours": "Daily: 11:00am to 5:00pm"
  }
]

```

4.3. AVA Map

Many of the wineries throughout the Tri-Cities area harvest their grapes from vineyards located in several different American Viticultural Areas. The AVA Map component of *Tri-Cities Wine Hub* offers an alternative form of the Winery Guide feature. Wineries are listed according to their respective AVA areas and a color-coded map of Washington state, which will be a custom SVG (Scalable Vector Graphic), will show where the wine-grapes from each particular list of wineries are grown. By implementing the techniques of two articles I have come across, Matthew Croak's *Creating an Interactive Map using SVG and CSS* and David Marcus' *How to make and Interactive and Responsive Map of US States & Capitals*, I will use CSS classes and jQuery to achieve this effect.



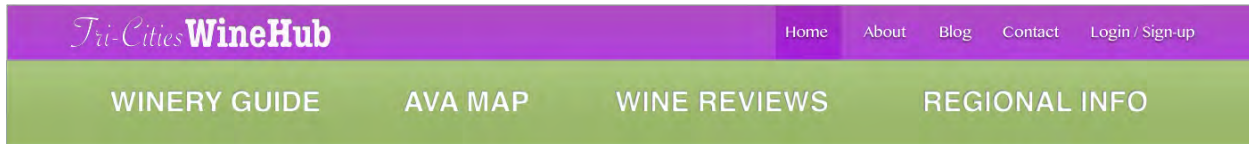
Figure 10. A rough draft version of an AVA map I created in Photoshop. The final version will be a SVG that will highlight the different regions via CSS classes and jQuery.

The same information that was seeded into the database for the Winery Guide via a JSON file will be manipulated with this feature. The Tri-Cities is surrounded by several AVAs, and this map will help the user visualize where the wine grapes are harvested for any given winery in the database. As with the Winery Guide, the basic information (address, contact information, etc) of the wineries will be provided to the user without logging in, but in order to add to their wish lists, favorite wineries, add comments, or create wine journal entries from the winery, users must have an account and be logged in.

4.5. Login and User Dashboard

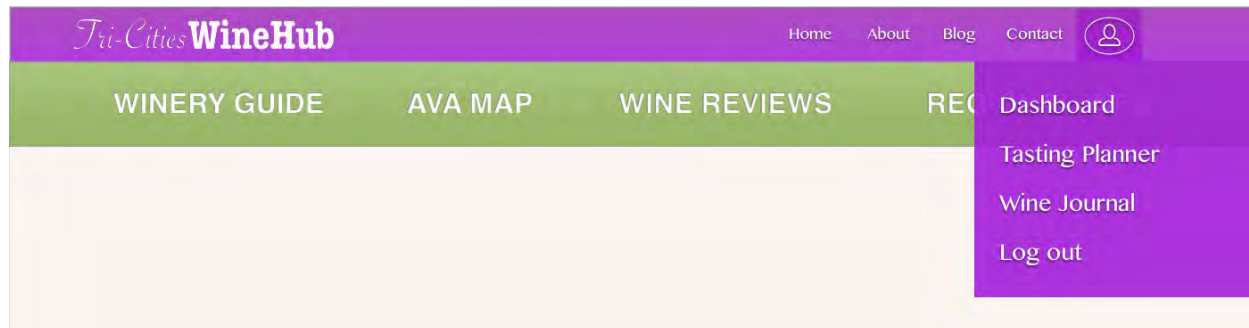
Users will have the option to create and log into an account that will give them access to more features. Laravel has great built-in authentication which I will take full advantage of. Also, as mentioned in the previous Technology section, Laravel 5.5 comes with blade directives that allow me to easily put in a few lines of code to be able to determine who the user is and if they are authenticated, thus granting them access to other non-public parts of the application.

Having a *Tri-Cities Wine Hub* account will grant access to the Dashboard, Planner and Wine Journal features along with the ability to add comments to wineries and share wine reviews/ratings. The Winery Guide, AVA Map, Wine Reviews (read only), and all other information will always be accessible to the public. Furthermore, the user will have a dashboard that keeps track of their previous activities, account info (password, etc), comments, and shared reviews.



Figures 11. (above) A Sketch design (rough draft) I made of the navigation bar when a user either doesn't have an account or isn't logged in.

Figures 12. (below) A Sketch design (rough draft) I made of the same navigation bar when a user is logged in. When the profile icon is clicked on, user-only options are revealed in a dropdown.



4.6. Tasting Planner

The Planner feature allows users to add wineries from the winery guide section to their wish lists and/or add the wineries to their favorites. From this wish list, they can create a “to-do” list of sorts that allows them to cross-off wineries as they visit them. Any favorited wineries from the winery guide will remain on their Favorited List until they are manually taken off. This allows the user to consistently be able to view their favorited wineries and put them on their itinerary for a winery tour. Once they visit a winery, the user can optionally cross it off the list or, if they like, add it to their favorites. When a winery has been visited, it goes to a section on the user’s dashboard that lists all previously visited wineries that the user crossed off of their planner.

4.7. Wine Journal

The Wine Journal feature enables the user to selectively take notes on wines that they taste from the wineries. These journal “entries” will be saved for future reference and are editable and the review portion of the entry is optionally shareable and will be added to the Wine Reviews Section. I will utilize Laravel’s pagination feature to sort the entries out with page numbers on the bottom of the Tasting Journal panel.



Figure 13. (above) Sketch design of a previously entered Wine Journal Entry in “view mode”.

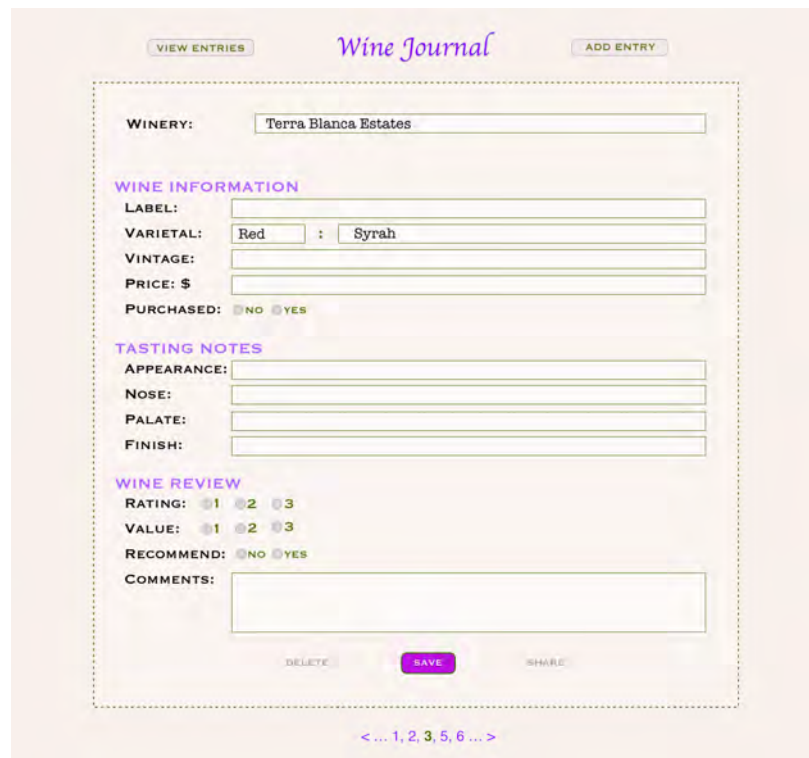


Figure 14. Sketch design of the Wine Journal “add mode”, which is a series of form inputs.

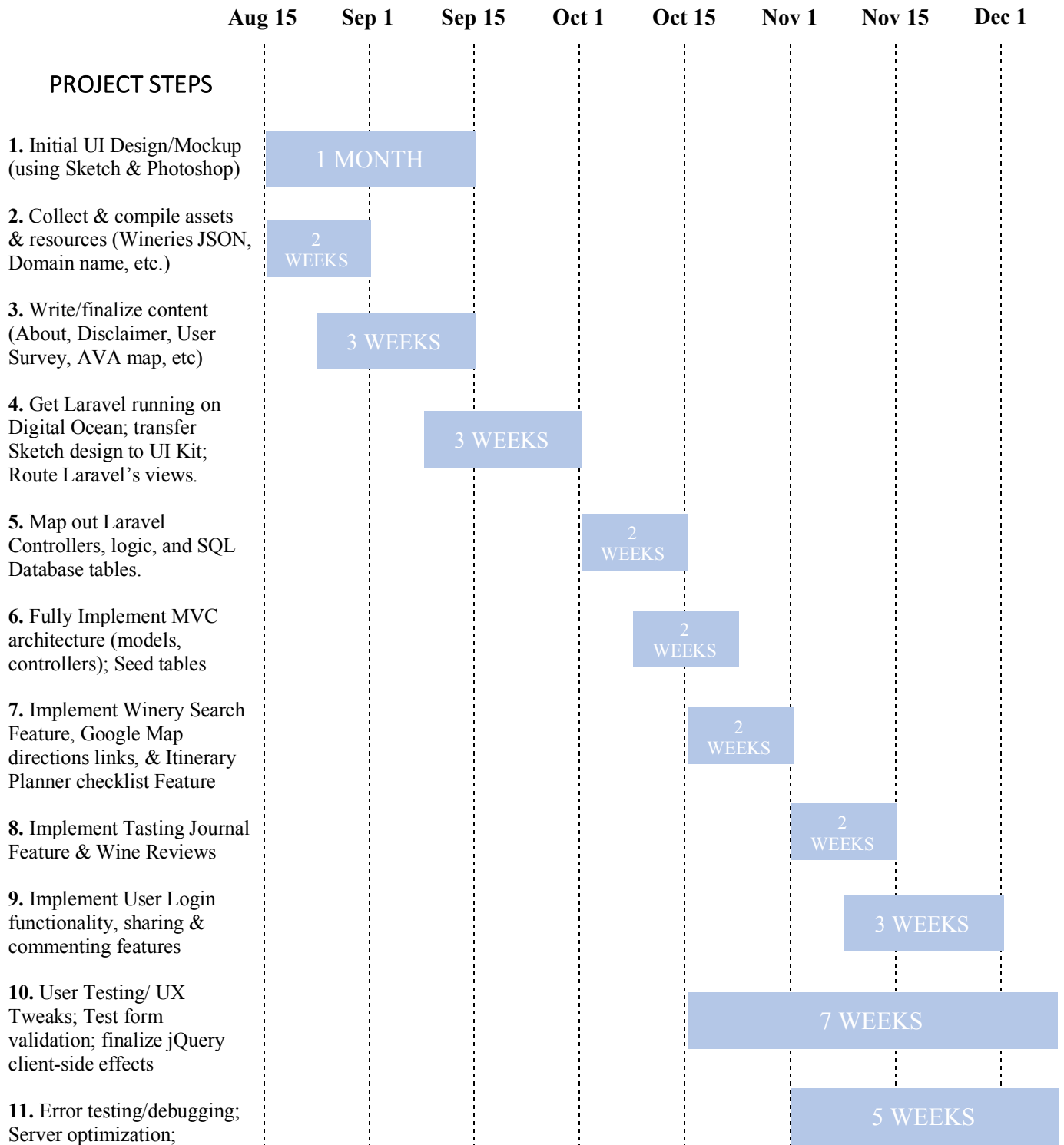
5. Work Plan and Milestones

5.1. Summary of Deliverables

The primary deliverable for the capstone is a fully operational dynamic web application that runs on a Digital Ocean server at www.tricitieswinehub.com. The following is a summary of the other deliverables that will be submitted with the capstone project. Refer to sections 5.2 and 5.3, which go into detail about the specific tentative due dates and descriptions of the deliverables via a Milestones Table.

- JSON file that catalogues all of the listed Wineries' Information
- Custom AVA Map SVG file
- Sketch/Photoshop Designs in JPEG format
- Customized SASS Files for the UI Kit framework
- Usability Survey Results
- Github repository for access to version-controlled code and Laravel's directory structure

5.2. Preliminary Schedule for Project Steps



5.3. Milestones and Deliverables Table

Milestone	Completion Date	Description of Deliverable(s)
Research; Data Collection; Custom Content	Aug. 31, 2018	<ul style="list-style-type: none"> • Winery Information is collected and compiled into a JSON file for seeding of MySQL Wineries table. (Minimum of 50 wineries). • The custom AVA Map of Washington State that outlines the AVA areas in the Tri-Cities wine region is production-ready. • Regional reference information is written, proofread and finalized. This includes content such as the About Section, Tasting Tips, and initial descriptions of the application's features, which will be implemented into user-clickable Info Buttons.
User Interface / Initial Web Design	Sep. 14, 2018	<ul style="list-style-type: none"> • The initial Sketch design files, exported into jpeg images for compatibility purposes, will demonstrate a "pre-coded" front-end basic design of the application, including the layout, color palate, iconography and user interface.
Mobile-responsive site runs on Digital Ocean; Frontend code is basically complete; Blade templated views are routed;	Sep 28, 2018	<ul style="list-style-type: none"> • <i>Tri-Cities Wine Hub</i> successfully runs on Digital Ocean with Views properly routed by using Laravel's routes. Users can view each page and browse throughout the site. Mock data is used for visual reference as the database tables will not yet be seeded or capable of CRUD (Create Read Update Delete) operations. • The site is responsive and closely resembles the initial static design, though changes will surely occur as each feature individually evolves.
Implementation of Winery Guide & AVA Map Features	Oct. 12, 2018	<ul style="list-style-type: none"> • The Winery Guide feature enables users to find and view wineries from certain search criteria. Users can view the wineries as they are dynamically listed and displayed from the JSON-seeded database table.

		<ul style="list-style-type: none"> The AVA map works by highlighting the region on the custom Washington SVG map and displaying a list of wineries from that region.
Implementation of Planner Feature	Oct. 26, 2018	<ul style="list-style-type: none"> Users can add wineries from the Winery Guide into their Planner Wishlist and Favorites. Within the Planner, they will be able to cross off wineries as they are visited and create a planned itinerary from their wish lists and favorites. User Logins will be in beta-testing with a pre-set Login authentication and password.
Implementation of Tasting Journal	Nov. 9, 2018	<ul style="list-style-type: none"> Users can create customized Tasting Journal entries and view, edit or delete them accordingly.
Implementation of Wine Reviews	Nov. 23, 2018	<ul style="list-style-type: none"> Users will be able to optionally create and share wine reviews from their Tasting Journal entry information. These wine reviews will be viewable from the Wine Reviews section from the home page and will also form an aggregate wine review score on the Winery Guide list information that will be sortable by most high average review to lowest average review.
User Commenting; Login/User Features fully implemented; Contact Form	Nov. 30, 2018	<ul style="list-style-type: none"> Users can comment on wineries from the Winery Guide section and view their comments in their My Comments section with the ability to write, edit and delete them accordingly. User login features will be fully user-tested by this point with the ability for users to create their own login passwords and accounts. The backend of the contact form works and is fully functional for use by users.
Capstone/Final	Dec. 14, 2018	<ul style="list-style-type: none"> User testing and cross-browser compatibility is completed. User survey results are compiled. Error reporting/Debugging is completed. Laravel validation for forms is thoroughly tested. <i>Tri-Cities Wine Hub</i>, in its current Phase 1 form, is finished and accessible.

6. Other Considerations: Post-Capstone?

If the goals of this capstone are fulfilled and everything goes as well as I surely hope they do, then *Tri-Cities Wine Hub* will be a user-friendly application with a rich feature-set geared toward a diverse audience of wine enthusiasts. However, there are many considerations, some complex, some simple, that I want to incorporate into the application post-capstone, or, if time permits (which it probably won't), as part of the capstone.

6.1. User Profile Customization & Advanced Social Media Features

I would like to expand upon the capabilities that the user has to customize his or her profile and perhaps share more information than simple comments and the user's name. Currently, in regard to my capstone proposal, I would be absolutely satisfied by successfully implementing user names, password authentication, and user-enabled features (such as the ability to comment or create tasting journal entries) that properly function. Especially since I have no previous experience with Laravel's authentication middleware or eloquent user features, or familiarity with how the MySQL tables will even relate to each other at this point, I don't think these custom features will be doable for the capstone.

Such profile customization would include photo uploads, an optional bio, and badges that are awarded for the user's contributions that can show others the level of experience he or she has with wine tasting and making contributions to the website in general. I would also like to incorporate a user following feature where users with similar tastes can follow each other and compare tasting notes and perhaps meet up during a planned wine tour. Far out stuff = Phase II.

6.2. Planner: Simultaneous Mapping with Google Map API

The current Planner feature that I proposed is more akin to a "to-do list" where wineries from wish-lists are shown as well as favorited wineries, visited wineries, and, most importantly, the user's current, planned itinerary. I would like to take things a step further and incorporate a mapping feature with Google's API where the course of the planned itinerary is actually mapped out with a visual representation of some kind. This is a fairly complex feature to code (for me, at least) given that I have very little experience with Google's map API and I could envision this being quite a lengthy process to execute. In fact, I had initially wanted to include this feature (and, if I find there is enough time, I very well may attempt it) but basic functionality is the most important aspect for me at this point. I don't feel this feature is absolutely necessary given that people can just use their smart phones to plug the addresses in and go from there, but it would enable the user to at least visualize the proximity of their intended wine visits, so they can plan a wine tour more efficiently.

6.3. Winery Guide Photography

I wanted to use UIKit's prepackaged lightbox component to create a jQuery display of photographs from each winery. When the thumbnail is clicked on, the picture expands into a slide show. The development part is simple; however, this would require me to spend a

lot of time traveling to wineries and taking photographs. I planned on spending a good part of the summer taking many photographs, but I want an extensive catalogue of wineries (at least 50) which would require way too much of my time. After photographing 5 or 6 wineries, I just had to cut this feature. The most important part of the Winery Guide is the information. Photography at this stage of the project simply isn't necessary.

6.3. Advanced Admin Capabilities

Previously, in section 4.2. Winery Guide, I covered how I will seed the wineries table via a compiled JSON file. My main idea (post-capstone), however, is to create an admin interface that enables me (or any authorized web admin) to add wineries via form inputs. The initial seeding of the database is still necessary but for future additions an interface would be better. Furthermore, as I currently have *Tri-Cities Wine Hub* planned out for the capstone, if a user put profanity in a comment or something derogatory in a wine review, I have to manually go into the database and delete it and maybe even delete the user. Not ideal. An admin interface would allow me to do these things with an actual interface on the website.

6.4. RESTful API with Angular

I had to make a serious wake-up call and come to the realization that my backend programming skills are still in their infancy when I decided to cut this idea I had. When I took my second application class and learned the MEAN stack, I really did not care for node, express or mongo at all. Maybe that was because I learned Laravel first, but either way, I just didn't like these technologies. With the "A" of MEAN (Angular), however, it was like love at first site (pun intended). I just absolutely loved angular and things really clicked for me. I just knew that I somehow had to use angular for my capstone and then I asked myself "Can I use Angular with Laravel?" And, after sifting through the web, the answer came. Yes, you can. It is awesome. Keep it in mind. But don't go too crazy just yet.

My initial plan for *Tri-Cities Wine Hub*, after doing some interesting research, was to meld the two applications course I took, Susan Buck's Laravel and Larry's MEAN, into one cohesive project. My aim was to create a REST API with Laravel and use Angular to tap into the services for the application, thus completely forgoing Blade or anything to do with Laravel on the frontend. I discovered two articles that laid out how to achieve this: *Creating APIs in Laravel 5.5 Using API Resources* by Devlob and *Laravel 5.5 Angular 4 Tutorial* by Krunal.

But the reality is that my skills with either program are somewhat limited, and I would much rather concentrate on Laravel and all the additional features I have never used, such as user authentication, a more complex relational MySQL database, pagination, newer validation features, and the countless Helpers I have no idea how to use. I am still very interested in creating a RESTful API because the need arose when I began collecting Winery information into a JSON file and realized how much easier it would be if there was an API somewhere I could just tap into.

7. References

Creating an Interactive Map using SVG and CSS

Croak, Matthew.

<https://medium.com/@mattcroak718/creating-an-interactive-map-using-svg-and-css-94a688c11bd6>

ABSTRACT: This article details the process of using an SVG (Scalable Vector Graphic) and CSS to create an interactive map and lays out the steps.

Creating APIs in Laravel 5.5 Using API Resources

Devlob.

<https://medium.com/@devlob/creating-apis-in-laravel-5-5-using-api-resources-9850c1b70efb>

ABSTRACT: This article is a basic tutorial on how to create a RESTful API with Laravel services.

DWA-15 Lecture Notes.

Buck, Susan.

<https://github.com/susanBuck/dwa15-spring2017-notes>.

ABSTRACT: Notes from Susan Buck's Dynamic Web Applications class.

Economic and Fiscal Impacts of Wine and Wine Grapes in Washington State

Washington Wine Commission

[https://www.washingtonwine.org/assets/fbe3541782fbf4b4275d78fc73fb1bed/CAI.WA%20Wine%20Commission%20Wine%20Industry%20Economic%20and%20Fiscal%20Impact%20Study%202015%200825%5B1%5D%20\(1\).pdf](https://www.washingtonwine.org/assets/fbe3541782fbf4b4275d78fc73fb1bed/CAI.WA%20Wine%20Commission%20Wine%20Industry%20Economic%20and%20Fiscal%20Impact%20Study%202015%200825%5B1%5D%20(1).pdf)

ABSTRACT: This extensive report covers the wine industry from an economic perspective throughout Washington state.

How Laravel Implements MVC and How to Use it Effectively

Ighodaro, Neo.

<https://blog.pusher.com/laravel-mvc-use/>

ABSTRACT: This article covers the basics of Laravel's MVC architecture and how to properly use it for the best efficiency.

How to Make an Interactive and Responsive Map of US States & Capitals

Marcus, David.

<https://websitebeaver.com/how-to-make-an-interactive-and-responsive-svg-map-of-us-states-capitals>

ABSTRACT: Step-by-step process of how to make an interactive map by using SVG files of states and capital cities as examples.

How to Organize Your Project with PHP and Laravel to Get the Best Structure in MVC Pattern
Grigorov, Lachezar

<http://grigorov.website/blog/how-to-organize-your-project-with-php-and-laravel-to-get-the-best-structure-in-mvc-pattern>

ABSTRACT: Covers the basics of how Laravel's Helpers can greatly enhance the MVC work flow of the framework.

Laravel 5.5 Angular 4 Tutorial

Krunal.

<https://appdividend.com/2017/09/22/laravel-5-5-angular-4-tutorial-example-scratch/>

ABSTRACT: Step-by-step tutorial on how to incorporate Angular into a Laravel project by using a REST API supplied by Laravel on the backend.

Laravel 5.5 LTS

Laravel News.

<https://laravel-news.com/category/laravel-5.5>

ABSTRACT: Covers the new features that come with the Laravel 5.5 release.

Laravel 5: Load Seed Data From JSON

Deering, Sam

<http://www.fullstack4u.com/laravel/laravel-5-load-seed-data-from-json/>

ABSTRACT: A guide to seeding data into MySQL tables by using a JSON file that imitates Laravel's migration for that table.

The Laravel Companion: A Guide to Helpers, Collections, and More.

Koster, Jonathon. (2018). Lulu.com.

ABSTRACT: An exhaustive reference to many of Laravel's most important features, particularly Helpers and Collections.

MEAN vs LAMP for Your Next Programming Project

Wayner, Peter

<https://www.infoworld.com/article/2937159/javascript/mean-vs-lamp-for-your-next-programming-project.html>

ABSTRACT: Covers the pros and cons of MEAN and LAMP stacks and how to go about choosing one for any given project.

Mike Locke Tutorial Website

<http://www.mlwebco.com/>

Pros & Cons of Frontend Frameworks

Schlesselman, Derek

<https://envisionitagency.com/blog/2018/04/pros-cons-front-end-web-frameworks/>

ABSTRACT: Simple pros and cons of either using a frontend framework or coding from scratch.

Regions & AVAs of Washington State

Washington State Wine Commission

<https://www.washingtonwine.org/wine/facts-and-stats/regions-and-avas>

ABSTRACT: Basic facts about the wine regions and viticultural designations throughout Washington state.

Ultimate Wine Guide: Washington Wine Country

Wine Press Northwest

<http://www.tri-cityherald.com/latest-news/article32062341.html>

ABSTRACT: A newspaper article that describes the various regions of Washington where wine grapes are harvested and wine is made.

What is a Full Stack Developer in 2018 and How to Become One?

Ganiukova, Kate.

<https://hackernoon.com/what-is-a-full-stack-developer-in-2018-and-how-to-become-one-ca82e8906c87>

ABSTRACT: The author, who is an experienced full-stack web developer, describes how the dynamics of the web development world are shifting as developers are beginning to diversify their skill sets.

What is the WUS Scale?

What Users Do.

<https://www.whatusersdo.com/what-website-usability-scale>

ABSTRACT: The concept of the “Website Usability Scale” is covered with a list of the survey questions and explanations of the scoring mechanism.

Why UIKit is better than Twitter Bootstrap

Sivokon, Eugene.

<https://www.eugenesisivokon.com/blog/why-uikit-is-better-than-twitter-bootstrap>

ABSTRACT: Explains the benefits, such as ease of customization and having a small footprint, that the UIKit frontend framework has over Twitter’s Bootstrap.

Wordpress vs Laravel

<https://belitsoft.com/laravel-development-services/cms-or-framework-wordpress-or-laravel>

Kazankov, Vladimir

ABSTRACT: Details the advantages and disadvantages of using a content management system like WordPress over an MVC framework like Laravel.