

NORTHWEST NAZARENE UNIVERSITY

Real Estate Website

THESIS

Submitted to the Department of Mathematics and Computer Science

in partial fulfillment of the requirements

for the degree of

BACHELOR OF SCIENCE

Marcus A. Antimie

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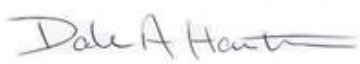
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Real Estate Website

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## **ABSTRACT**

Utilizing web development and design to create a website to create an outlet and a communication bridge between real estate agents and their clients.

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Web development has created a way for businesses to reach millions of clientele and understanding web design has become a leading marketing skill in the advertising industry. Millions of homes are sold each year and a majority of them are sold through databases accessed by real estate agents, and clients reach these agents through websites which are designed to inform the client. The purpose of this project was to create a website which is designed to attract clients, utilize forms and outlets for clients to reach the agent, provide information for clients to learn more about the area they are interested in purchasing a home, and to see listings the agents have a direct relationship with the sellers. After 120+ hours of HTML, CSS, JavaScript, meetings with the agent and research on design and development of real estate websites, the result was a website that contained a welcoming home page showing some of the properties sold by the agent, a contact page with a questions form, a listings page with information of homes currently available and homes previously sold, and an about page sharing information and important information when contemplating buying a home in the Treasure Valley of Idaho.

## **Acknowledgements**

I would like to acknowledge my professors who have supported me and guided me through this entire college journey, including this project. I would also like to show appreciation to my parents and my fiancé, who without their prayers, support, motivation, and inspiration, this would not have been possible for me.

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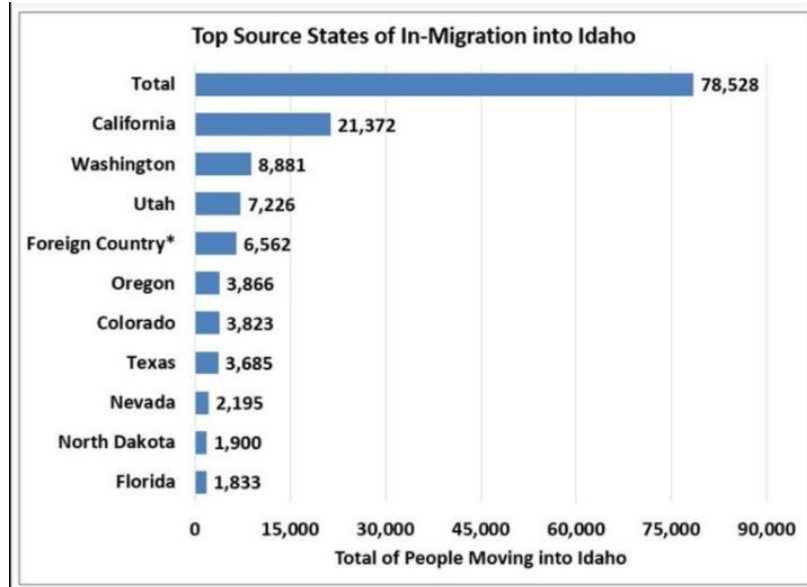
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## **Introduction**

Over 5 million homes are bought and sold each year, and to aid the process of clients finding a home that meets their wants and needs, many of these homes are listed on MLS (multiple listing service) websites. These websites are used by real estate agents and clientele to scan the market and see what best fits them through filters such as: number of bedrooms, bathrooms, square footage, size of land, price range, etc. Agents have access to an IDX (Internet Data Display) which provides them with information like price change, age of home, status of home, and many other features. Many clients can also see home information through an IDX website but many of these websites are very professional and not very personalized. This project was to create a website that has a personal touch between a client (a local realtor in the Treasure Valley), and their many clients.

## **Background**

This project was the creation of a website that creates a bridge of communication as well as accurate, updated information pertaining to the Treasure Valley. Users would be able to access this website to see any changes regarding homes they may be interested in or information on connecting with an agent to potentially sell their home. This website also contains a section sharing information about many cities in the Treasure Valley about climate, population, cost of living, quality of life, etc. These are all questions that clients from out-of-state ask this agent. This website was created to bring a more personal approach to the professional relationship between an agent and their clientele.



**Figure 1 - People Moving into Idaho**

## Implementation

Knowing the area is very important to understanding why this website contains so much information about the Treasure Valley. According to Businessinsider.com, out of about 80,000 people that moved to Idaho in 2018, about 26% were from California, and more than 194% more people moved to Idaho than those that left the state. Creating a website that can inform potentially thousands of clients considering moving to Idaho was the motivation and inspiration in completing this project. This website has the potential to help this realtor expand their business and marketing outlets as well as be an addition to a website portfolio for the developer and designer. Creating this website vs hiring someone to complete this is also a question of consideration, because this is where the cost of building and designing a website comes in. According to websitebuilderexpert.com, the cost to build a website is around \$200 and around \$50/month to maintain it, whereas a hired designer or developer can expect to charge around \$6,000 upfront and about \$1,000/year to maintain. The cost was a major factor in the idea of



hiring a college student for a project vs hiring a top-of-the-line web developer and designer expert. When creating a website, some of the costs would be a website domain, website hosting, website content, SEO, and marketing, etc. Depending on the resource used, this will vary the cost and website content is relatively free. When hiring a web developer, website content can go upwards of \$5,000.

Implementation began with the developer sitting with the real estate agent to discuss expectations, limitations, budget, time frame, and the overall picture of the project. After which, the developer decided on tools, a web host which provided the domain name, as well as communication and SEO. The tools that were used were HTML, JavaScript, and Bootstrap. For the Web Host, Host Gator was chosen because of good reviews as well as the simple and easy to use layout through research of multiple web hosts. The web host contained a subscription fee which was covered by the real estate agent as well as provided the domain name NampaBoiseHomes.com which was desired by the agent. SEO was also used in the creation of this website which allows the ability to prioritize the website on search engines like Google. From here, the code editor Visual Studio Code was chosen because of the similarity with Visual Studio 2019 that the developer had experience in. For a more complete explanation of the history, capabilities, and complexity of tools and concepts used in the implantation of this project, please see the *Glossary of Terms* on page 11.

## **Process**

For this project, the process began with a meeting with the realtor. This was to sit down and understand and discuss the expectations as well as expected limitations of this project. Some of the questions discussed with the agent were: What is the budget of this project? Who is our target audience? What is the theme desired for the website? What is the desired domain name?

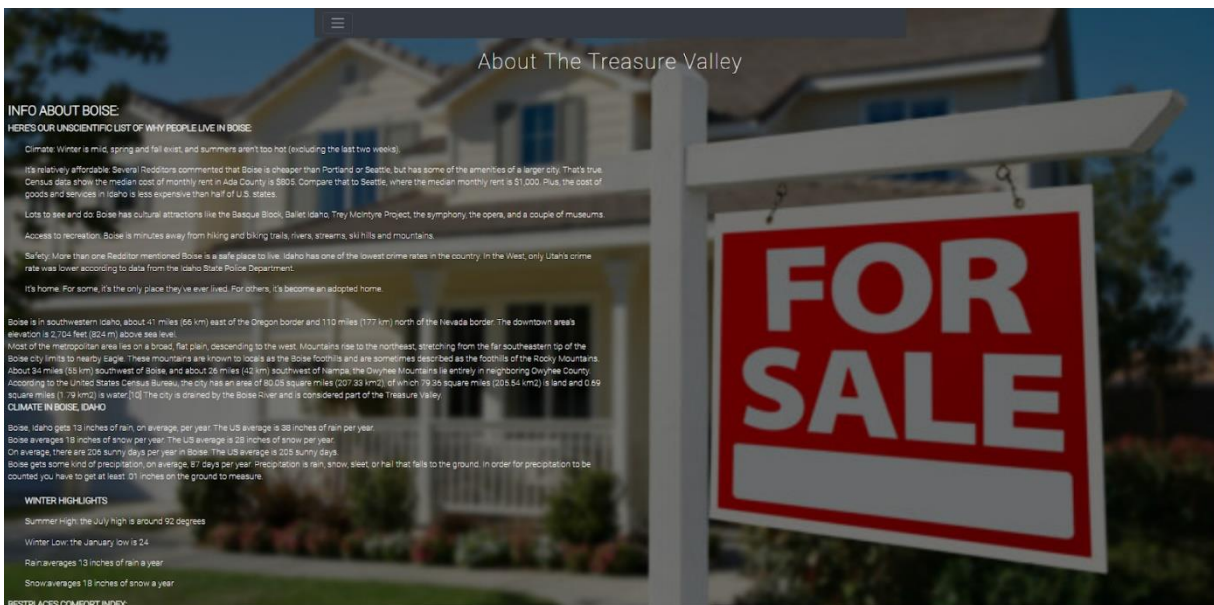
Does the developer have access to the IDX and MLS database? What level of security is needed for this site? and other questions of this nature. After discussing and understanding the final goal, the next step was to decide which tools should be used. For this project, the source-code editor chosen was Visual Studio Code. The developer chose this because of the very easy and similar layout to Visual Studio 2019. Bootstrap was also chosen because of the amount of libraries and the ability to reuse certain segments of code to complete this project. The reason this was chosen over standard HTML, and CSS, was because Bootstrap provided a grid system to make placement and positioning much easier than in CSS, plus Bootstrap has already created multiple classes and templates which created a relatively better theme overall.

After meeting with the agent the domain name “<http://www.nampaboisehomes.com>” was found to be available and was chosen. The developer decided to go with HostGator as the web hosting provider because their services met the agents' needs for the website. The developer then coded the Home page and created three other pages: About, Contact, and Listings. The Home page is a sleek page designed to greet the client and has a carousel, which is a function in the Bootstrap library making it possible for the developer to just drop in pictures. The carousel goes through a timed slideshow, showing images of homes for sale and sold by the agent.



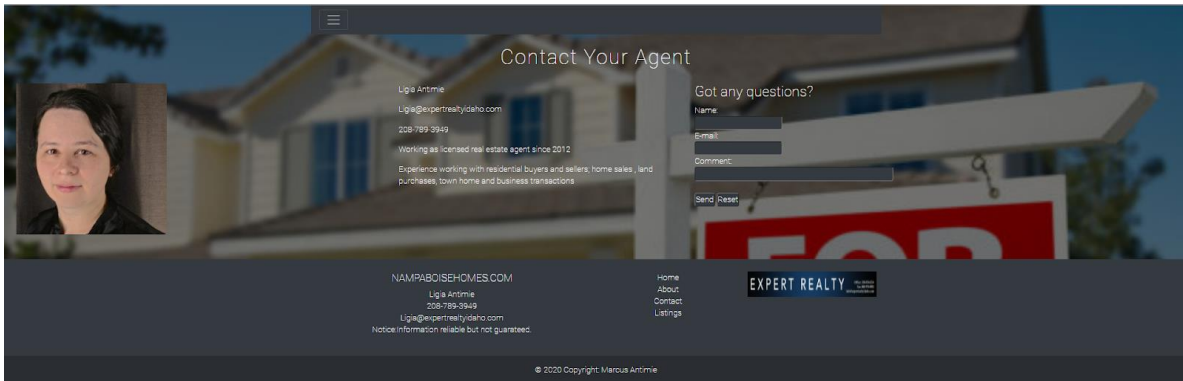
**Figure 3 - Home page**

The About page was designed to contain information provided by the agent to the developer about the Treasure Valley as mentioned above.



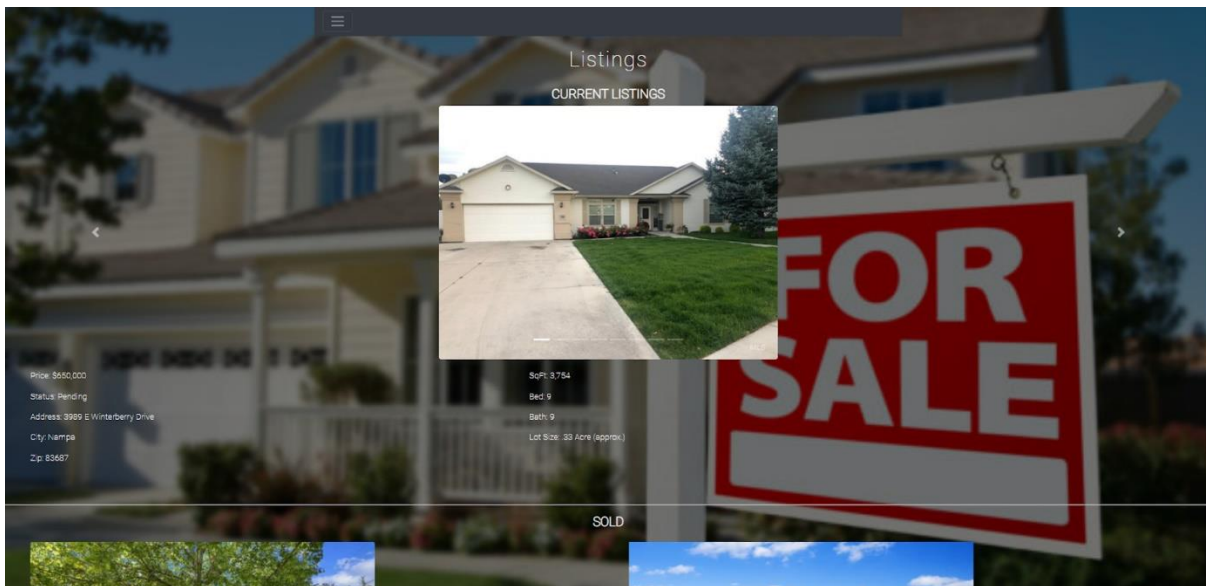
**Figure 4 - About Page**

The Contact page was designed to share and inform users about the agent seeking the client's business. This page also has integrated into it a forum where clients can ask questions or seek help from the agent, straight from the agent's website.



**Figure 5 - Contact Page**

The Listing page has a current listing section which is also a carousel, which is slideshowing through a home that is currently for sale. This shows images of the home specific to the listing. Underneath is information such as: Price, Status, Address, City, Zip, Sqft, Bed, etc. Underneath the current Listing section, there is a Sold section where it shows homes that were previously sold and purchased through this agent. This is designed to give clients an idea of the experience the agent has as well as past listings.



**Figure 6 - Listings Page**

Research was also a substantial part of this project to understand what the best approach was in creating an effective bridge of communication between the agent and their clients. Learning how to use Bootstrap and which libraries are the best was also a part of the process. Choosing a web host required research in looking at prices, seeing services offered, which allowed potentially multiple domain names for future websites as well as allowed a large amount of data uploaded to the web hosts server.

Some of the challenges encountered in this project were time constraints, lack of communication between the agent and the IDX licensing owner to provide access to the developer, prior coding and position before Bootstrap was used, financials whereas the agent didn't wish to use WordPress as a content management system for future work. There is an agreement between the agent and the developer that compensates for future maintenance to the site.

### **Result & Future Work**

One result of this project was creations of a reference capability where clients can share with friends and family about this agent by send them to the website. This has also added a new marketing outlet for the agent to share with potential customers in the future. Through the agreement between the developer and the agent, updates to the website will be done by the developer without using WordPress or any other content management system. Another result of developing this website has been an addition to the web developer's portfolio to show future clientele what the web developer is capable of and how they can meet customers wants and needs in the web design and development area. Future work and versions of the website could consist of a proper MLS system integrated into the agent's website under a "Search" page, a list of past clients being used as references for the agent, a mortgage calculator for the Treasure

Valley Area, links to different websites supporting information on the site like cost of living, population, etc., and many other features. Because of the limited time and resources dedicated to this project, this was not possible for this version of the website but may very well be added soon.

## References

About the Editorial Staff Editorial Staff at WPBeginner is a team of WordPress experts led

by Syed Balkhi. Trusted by over 1.3 million readers worldwide. (2021, March 06).

Domain name vs. web hosting - what's the difference? (explained). Retrieved March 31, 2021, from <https://www.wpbeginner.com/beginners-guide/whats-the-difference-between-domain-name-and-web-hosting-explained/>

Antimie, L. (n.d.). Nampaboishomes.com. Retrieved March 31, 2021, from

<http://nampaboishomes.com/>

Carney, L. (2020, December 01). How much does a website cost in 2021? (FULL

Breakdown). Retrieved March 31, 2021, from <https://www.wpexpert.com/building-websites/how-much-should-a-website-cost/>

Chen, J. (2020, December 14). Multiple listing service – mls definition. Retrieved March

31, 2021, from [https://www.investopedia.com/terms/m/multiple-listing-service-mls.asp#:~:text=A%20multiple%20listing%20service%20\(MLS\)%20is%20a%20database%20established%20by,of%20connecting%20homebuyers%20to%20sellers.](https://www.investopedia.com/terms/m/multiple-listing-service-mls.asp#:~:text=A%20multiple%20listing%20service%20(MLS)%20is%20a%20database%20established%20by,of%20connecting%20homebuyers%20to%20sellers.)

IDX resources for realtors. (n.d.). Retrieved March 31, 2021, from

[https://www.nar.realtor/realtorae.nsf/pages/memberIDX?OpenDocument#:~:text=Internet%20Data%20Display%20\(IDX\)%20is,been%20doing%20it%20for%20years.](https://www.nar.realtor/realtorae.nsf/pages/memberIDX?OpenDocument#:~:text=Internet%20Data%20Display%20(IDX)%20is,been%20doing%20it%20for%20years.)

Learn web development. (2021). Retrieved March 31, 2021, from

[https://developer.mozilla.org/en-](https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/HTML_basics)

[US/docs/Learn/Getting\\_started\\_with\\_the\\_web/HTML\\_basics](https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/HTML_basics)

Lithmee. (2018, August 15). Difference between bootstrap and css. Retrieved March 31,

2021, from <https://pediaa.com/difference-between-bootstrap-and-css/>

Ramey, A. (2019, January 28). Yes, many Californians are moving to IDAHO. here are the

other states new residents are coming from. Retrieved March 31, 2021, from

[https://www.ktvb.com/article/news/local/yes-many-californians-are-moving-to-](https://www.ktvb.com/article/news/local/yes-many-californians-are-moving-to-idaho-here-are-the-other-states-new-residents-are-coming-from/277-f65f25f1-6752-427a-b107-a27e5ca09417)

[idaho-here-are-the-other-states-new-residents-are-coming-from/277-f65f25f1-6752-427a-b107-a27e5ca09417](https://www.ktvb.com/article/news/local/yes-many-californians-are-moving-to-idaho-here-are-the-other-states-new-residents-are-coming-from/277-f65f25f1-6752-427a-b107-a27e5ca09417)

Warren, K. (2020, August 25). I talked to 3 millennials who gave Up BIG-CITY lives in

California and moved to Boise. Here's how they feel about adjusting to small-town life in Idaho. Retrieved March 31, 2021, from

[https://www.businessinsider.com/why-millennials-are-moving-from-california-to-boise-idaho-2019-](https://www.businessinsider.com/why-millennials-are-moving-from-california-to-boise-idaho-2019-12#:~:text=And%20of%20the%20almost%2080%2C000,population%20than%20any%20other%20state.)

[12#:~:text=And%20of%20the%20almost%2080%2C000,population%20than%20any%20other%20state.](https://www.businessinsider.com/why-millennials-are-moving-from-california-to-boise-idaho-2019-12#:~:text=And%20of%20the%20almost%2080%2C000,population%20than%20any%20other%20state.)

Web terms 101. (n.d.). Retrieved March 31, 2021, from

<https://domains.google/learn/web-terms-101/>



## Glossary of Terms

**Domain name** is the name of a website. According to Domains.google.com, a domain name needs to be purchased by a domain host where one can check to see that the name is available and no one else is using. This is what is in between the “www.” and the “.com, .net, .edu, etc.”. When a domain name is purchased, the recipient can choose between “.com, .net, .org” based on the company or organization they are representing. Usually, this domain name is purchased through an annual fee and in some cases, if the domain is taken or a popular search engine keyword, one can request to purchase a domain name for usually a much larger price tag. URL is the entire web address such as: <http://www.google.com>.

*“A **URL** (aka Universal Resource Locator) is a complete web address used to find a particular web page. While the domain is the name of the website, a URL will lead to any one of the pages within the website. Every URL contains a domain name, as well as other components needed to locate the specific page or piece of content (domains.google.com, 2021)”*

**Web Hosting** is where all the files and of a website reside. When someone types a URL in, the web browser will translate the URL into an IP address of a computer at a web host company holding the URL. The computer at the web host company will then send back all the website files and present the website as coded in the files (Wpbeginner.com, 2021). These files that are transferred back to the browser from the web host, are in most cases HTML, CSS, and JavaScript type files.

**HTML** (Hypertext Markup Language) is the code that is used to structure a web page and its content. This consists of a series of elements which can be used to enclose, wrap, appearance, or act in certain ways (MDN Web Docs, 2021).

An example of this would be:

```
<p>Hello world!<p>
```

This would be:

Hello World!

From here the developer would create an HTML file, in some cases by adding “.html” at the end of a text file and this would create a file that would open in the default web browser. To adjust positioning, color, style, and all the other ways that the content appears on a web page, the developer creates “.CSS” files.

**CSS** (Cascading Style Sheets) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. These use libraries to access style sheets and different creative tools to make the web page have the theme it does. An example of this would be using the original html file containing:

```
<p> Hello World!<p>
```

Then creating a .CSS file containing:

```
p{  
  
    color: red;  
  
    font: normal 16px;  
  
    font-family: "Vivaldi", cursive";  
  
}
```

This would result in a web page containing:

*Hello World*

**JavaScript** is a common programming language used to use object-oriented design as well as functions in web development. It is used to create interactive behaviors on web pages through things like apps, buttons, forums, etc.

For most of this project, **Bootstrap** was used, which is a framework containing HTML, CSS, and JavaScript through different libraries obtained from Bootstrap. This allows a developer to take code and different functions and libraries in Bootstrap and use them in their own code to complete whatever task the developer decides to use them for. Bootstrap makes it very easy to work with positioning, hovering events, different templates designed to cut a developer's workload, and easier with cross platforms. This makes it so that the web content resizes on different size monitors. The image below shows some of the differences and advantages of using Bootstrap over CSS.

<b>BOOTSTRAP</b>	
<b>VERSUS</b>	
<b>CSS</b>	
BOOTSTRAP	CSS
A free and open source front-end framework for designing websites and web applications	A style sheet language used for describing the presentation of a document written in a markup language such as HTML
Provides a grid system, which creates a page layout through a series of rows and columns that can place the content	There is no grid system
Contains already designed classes. The programmer can use them in his program to add styling to the elements without writing code from the beginning	The programmer should write the code from scratch
Comes with more features	Comparatively few features
Has Bootstrap 3,4	Has CSS 1, 2,3 versions
Helps to create responsive designs that are more presentable	Helps to create presentable webpages
	Visit <a href="http://www.PEDIAA.com">www.PEDIAA.com</a>

## Figure 2 - Bootstrap vs CSS

**Visual Studio Code** is a coding software that can be used to compile many different programming languages such as C, Java, Python, and many others. In the case of coding in HTML, CSS, JavaScript, Bootstrap, and other web development languages, a developer can use almost any text file editing software that will allow files to be converted to .html, .css, .js, etc. In the use of this project, the developer used VS Code because of the layout the software itself contains. The software also has a helpful autocomplete system to help the developer type code faster.

**SEO**, (search engine optimization) is a process that web developers use to improve the quantity and quality of web traffic to a specified site. In basic terms, this is a way that web developers can use keywords, images, web traffic models, and other tools and skills to make the website more popular. Successful SEO can potentially generate thousands if not millions of internet users through your website, which can help create traffic to different businesses. In some cases, customers and domain owners pay to have their page hosted as the first couple of links on popular search engines like Google, but with a SEO team, web developers can create a website that will be the first just because of good quality and a great quantity of customers accessing that site.

Lastly, IDX and MLS. According to Resources for realtors & Business specialties, “**IDX** (Internet Data Display) is a policy that allows brokers to exchange consent to display one another’s property listings on the Internet.” In other words, it’s an agreement that allows an agent to advertise another agent’s property on their own site. This generates business for both the selling and the buying agent.

“**MLS**, (multiple listing service) is a database established by cooperating real estate brokers to provide data about properties for sale. An MLS allows brokers to see one another’s listings of properties for sale with the goal of connecting homebuyers to sellers” (Chen, 2020).