

Yuping Feng

WEBSITE DEVELOPMENT USING THE CUSTOMIZED WORDPRESS THEME

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Yuping Feng
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ABSTRACT

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The objective of this bachelor's thesis was to develop a responsive travel blog website which uses a customized WordPress theme. The website can be used for introducing and sharing stories, images and experiences of travelling all over the world.

For user interface design, a tool named Axure RP was used to draw a prototype. During the process of building a static website, web technologies Bootstrap and Font Awesome were applied. PHP was utilized for building the customized theme of WordPress, and PHP code editing was controlled in the Control Panel of server. Features of the website were implemented in the WordPress admin system.

As a result of the work, a responsive blog website, which can adjust to different sizes of screen, was implemented. Moreover, a customized theme of WordPress was built as well. In the future, the author plans to polish the theme and upload to WordPress.org.

Keywords: Bootstrap, WordPress, Website, Theme, CMS, PHP

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ABBREVIATIONS

CMS	Content Management System
MySQL	My Structured Query Language
PHP	Hypertext Preprocessor
HTTPS	Hypertext Transfer Protocol Secure
AMP	Apache, MySQL, PHP/Perl/Python
HTML	Hyper Text Markup Language
CSS	Cascading Style Sheets
DNS	Domain Name System
RP	Rapid Prototyping
CDN	Content Delivery Network
URL	Uniform Resource Locator

PREFACE

This thesis was made at Oulu University of Applied Sciences, Finland. During working on the thesis, I learnt a lot of skills of programming and scientific writing. Fortunately, many people provided assistance to me, and I am very appreciative of their support and selfless help.

First of all, I would like to sincerely express my gratitude to my supervisor Kari Laitinen. I am thankful for his patience and guidance. He always gave me some useful suggestions when I felt confused about some problems during the writing of thesis. My thesis was improved by his advices.

Secondly, I am very grateful to Kaija Posio for language checking. She is a conscientious teacher. Moreover, I would like to extend my gratitude to all teachers at Oulu University of Applied Sciences. Through their courses, I was inspired to learn new technologies efficiently. Thus, these courses laid a solid foundation for the completion of my thesis.

Then, I would also like to thank my dear friends for their company and support. We encourage each other and inspire each other. I wish them a good future.

Finally, I would like to deeply appreciate my most beloved family. They have always given me unconditional love and support in my study and life.

All in all, thanks to everyone who helped me during my thesis work.

Oulu, 7.5.2018

Yuping Feng

1 INTRODUCTION

The purpose of the thesis work was to design and develop a travel blog website according to the actual situation and the characteristics of blog interactivity, aiming at providing a platform for website visitors to communicate with each other and for sharing travel information between visitors. On the basis of the characteristics of the blog sharing, the travel blog website can promote information and knowledge exchange among users.

In Finland, websites are widely used. Basically, governments, schools, enterprises and even supermarkets all have their own websites. People can find desired information on these websites conveniently. In addition, there are a lot of people having their own blog sites, which makes the information spread more rapidly and forms a unique blog culture. Blogs cover a wide range of topics, from cooking to travelling, from fashion to photography.

In 1994, the first blog was created. The progress of blog until the current microblogging platform is extremely important on the Internet development. Nowadays, there are many different ways to build a blog on the Internet, such as WordPress, Tumblr, Squarespace. Even so, WordPress hosted 74.6 million websites approximately in February 2014. It is a popular platform for building blogs. Moreover, WordPress sites occupied 18.9% of all self-hosted websites at that time. As a matter of fact, 75 million websites were operated by WordPress until the end of 2016 [1]. Hence, in this thesis study, WordPress was chosen as the platform for the travel blog website.

The objective of this travel blog includes providing a platform for learning and communicating information between website visitors, sharing photos and stories of travel around the world. A user can not only read the travel story on the travel blog, but users can also contribute their own stories to administrator on blog. This kind of behavior promotes the spread of information. Even if users do not go out, they can still view different landscapes and experience different cultures through the travel blog. The user requires only a mobile device or a desktop computer.

2 BACKGROUND

The aim of this chapter is to give a description of what kinds of software, technology, tools and programming languages were used in this thesis project.

2.1 WordPress

WordPress is a user-friendly content management system(CMS) that can be used to create websites, applications and blogs. It is a free open source software based on MySQL and PHP [2]. It should be installed at a web hosting or a software platform which can support PHP, MySQL and HTTPS. For instance, MAMP for Mac operating system, XAMPP for Windows operating system, and LAMP for Linux operating system.

Nowadays many websites are developed by WordPress because of the multiple themes and user-friendly management system. Developers can create a customized theme and use various plugins according to customers' requirement. Website administrators can use the WordPress CMS to add and delete contents of website easily. There are some successful and popular cases, such as Angry Birds, BBC America, Vogue India and Mercedes-Benz [3].

With these advantages, WordPress is daily used by millions of websites and seen by tens of millions of users because it is the largest and the most popular tool for self-hosted blogging service all over the world [4]. Thus, WordPress is supporting and powering 26.4% of the Web on the basis of stats since March 2016, and it keeps increasing [5].

2.2 Bootstrap

Bootstrap is an open source front-end component library for website and web application development, including the HTML, CSS and JavaScript frameworks [6]. Bootstrap also provides fonts, forms, buttons, navigations, and other useful components, then it makes the development of a responsive website and web application easier and faster.

Due to the feature of mobile first, Bootstrap defines the basic style of a series of HTML components, and designs a unique, modern style for a text, form and grid system [7]. The other function of Bootstrap is the reusable components. In addition to the basic HTML elements, Bootstrap also includes other commonly used interface elements, such as a button with advanced features, labels, thumbnails and progress bars. These components are using the CSS class to implement. It needs to correspond to the specific HTML element [8]. According to jQuery, Bootstrap adds some JavaScript components and enhances some functionalities of user interface elements. Plugins can be used together, or one by one easily [9].

Contemporarily, Bootstrap is the most popular front-end framework in the world. Spotify's website was published in September 9 2015, is an example of using Bootstrap [10].

2.3 Web hosting

The web hosting service uses the data center's computer clusters and storage devices to provide free or paid service for a client. It allows individuals and organizations to publish a website to the Internet. Normally, the hosting company will provide a control panel for the client to upload the web content remotely. Then others can access the website by entering the website address or domain name into the browser [11].

There are several advantages of web hosting. Firstly, compared with the purchase of independent servers, the cost of website construction has been greatly reduced, which has greatly facilitated the popularity of small and medium-sized websites. Secondly, using the technology of web hosting, a real host can be divided into a number of virtual hosting. Each web hosting has an independent domain name and IP address, and it has full Internet server functionality as well. In addition, the high-efficiency is a significant benefit. The efficiency of website building has improved when using the web hosting, but it takes a longer time if a user purchases the server and installs the operating system and software application by themselves [12].

On the other hand, the web hosting has also some disadvantages. First, some functions are limited by the server providers, such as forum programs and traffic statistics functions. Then, the website design needs to consider the functional support provided by the service provider, such as the database type or operating system. Furthermore, some websites using the web hosting are slow

to access. This may be because the hosting provider is leasing a host to a large number of websites or because of the aspect of server configuration. This situation cannot be solved by the website itself, and it may have adverse effects on the normal access of the website [12].

2.4 Domain name

A domain name is the name of computer or a group of computers that consists of a string of dot-separated names. It is used to identify the electronic direction of the computer during data transmission. In short, Internet users can access the website through the address of domain name. It is hard for people to remember a string of numbers, such as computer's IP addresses. Hence, the development of domain name is beneficial for user identification instead of IP addresses.

For example, `www.google.com` is a domain name, and the `8.8.8.8` is the corresponding IP address. DNS is like an automatic telephone directory. A user can call Google's name instead of the telephone number—IP address. After the user has called the website's name directly, DNS will convert the user-friendly name, such as `www.google.com` into an IP address, e.g. `8.8.8.8`, which is convenient for machine identification [13].

The domain name can be a random combination of letters and numbers, and the various domain name extensions can be combined into the domain name, such as `.com`, `.org`, `.net`. The domain name becomes valid after being registered, and it is unique so that there will not be the situation that the same domain name shows up at the same time [14].

3 DESIGN

The design part is the beginning phase of a project or product, and it is very important for the product usability. Usability is a user-centered design concept. The design of usability focuses on how to make the product design meet a user's habit and need. The design of an Internet site, for example, aims that users can have a smooth browsing process [15].

The judge criterion of the usability can be divided into three aspects: effectiveness, efficiency and satisfaction. There are three primary results of the usable interface. Firstly, during the first contact with the website, users should be familiar with and be able to use the user interface. For instance, if a blog website is user-friendly and well designed, then users should be able to find the interesting content very fast. Secondly, users can achieve their goal easily by using the website. An excellent design will guide users to leave messages for the blogger if needed. Finally, users should feel effortless to remember the user interface and how to use it in the future. Thus, it means that users should get to know how to find the useful information next time through an impressed design of the blog website [16].

A user interface designer tries to improve the design's usability during the entire development process, from a functional map to a wireframe and from a mockup to a prototype and to the final design. Because the usability decides whether the existing property of the design succeeds or fails [16].

3.1 Requirements specification

Before coding in a project, the requirements specification of the website needs to be prepared. It is used for describing the user interactions that the website must provide. It includes functional requirements and non-functional requirements. The requirements specification of this blog website was implemented individually instead of cooperating with a client.

3.1.1 Functional requirements design

The functional requirements assign what the website should do [17]. In the thesis's blog website, the designed functional requirements are:

- With the website, users should be able to follow and browse the latest images, stories and blogs.
- With the website, users should be able to contact the blogger and upload the images and stories that they wish to share.
- With the website, users should be able to comment the blog.
- The administrator should be able to manage images, stories and blogs in the admin system.
- The administrator should be able to get the message from the user and choose the interesting images and stories to post on the blog.

3.1.2 Non-functional requirements design

The non-functional requirements describe how a website operates. There are some representative non-functional requirements: capacity, reliability, maintainability, performance, modifiability [17]. In the thesis's blog website, the designed non-functional requirements are:

- The admin system should provide content modifiability.
- The website should be responsive, dynamic and user-friendly.

3.2 User interface design

User interface design is primarily used for software or machine's user interface, such as computers, mobile devices, applications, websites and electronic devices. It follows the guidance of user experience and interaction and focuses on the ease of use and comfort level for users. Creating the user's interaction using an easy and high-efficiency way is the aim of user interface design. In addition, there are three principles of user interface design. Firstly, the interface should be under the control of users. Secondly, the user interface design should lighten the user's burden of memory. Thirdly, the user interface design should maintain the consistency of the interface [18].

Basically, there is an 8-step process to develop the user interface design. It contains understanding the project's concept, brainstorming and sketching, user flow diagram, structure and flow validation,

choosing the style of the interface, style validation, choosing and creating the preview form, such as wireframe, mockup and clickable prototype, and the final step is design validation [19].

3.2.1 Axure RP

In this work, the Axure RP (Rapid Prototyping) 8 is the tool that was used for creating the user interface design. Axure is a powerful prototyping tool which does not need to write any code. There are some particularly useful features of Axure RP, including dynamic content, conditional flow, animations, data driven, adaptive views and math functions. Besides, the design project builds by Axure is easy to share. The user needs to click a button, then the Axure Share will generate a link and publish the diagrams and prototypes on cloud. Then other users would be able to check the project by the link [20].

The Axure Share App is also available for iOS and Android except for using a browser to open the link. The Axure RP is supporting a team collaboration as well. It allows working on the same file by many people in the meantime. Thus, it is easier for a team work, and the team project history allows showing the notes of changes from team members [20].

3.2.2 Sitemap

Sitemap is the hierarchical chart demonstrating the website or application's structure. The user experience designer used the sitemap to define the category through grouping the related content. The sitemap is a very important part of user-centered design because the designer needs to ensure that the content is located in the user's desired position.

In regard to the purpose of sitemap, it displays how to structure the navigation. And the sitemap is beneficial to identify the place of content and produce the content. In addition, relationships between different pages are shown by sitemap [21]. Hence, building a sitemap makes the functionality of a website or an application more clear. Axure RP was the tool used to draw the sitemap in this thesis (Figure 1).

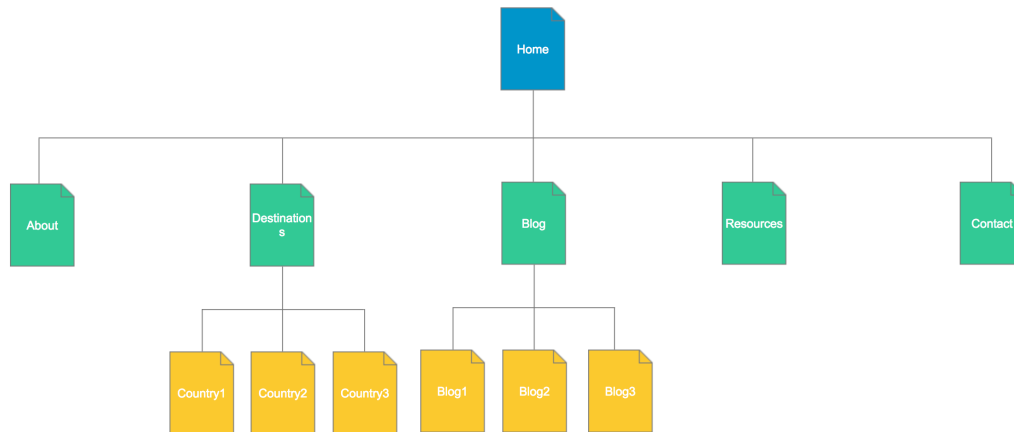


FIGURE 1. Sitemap

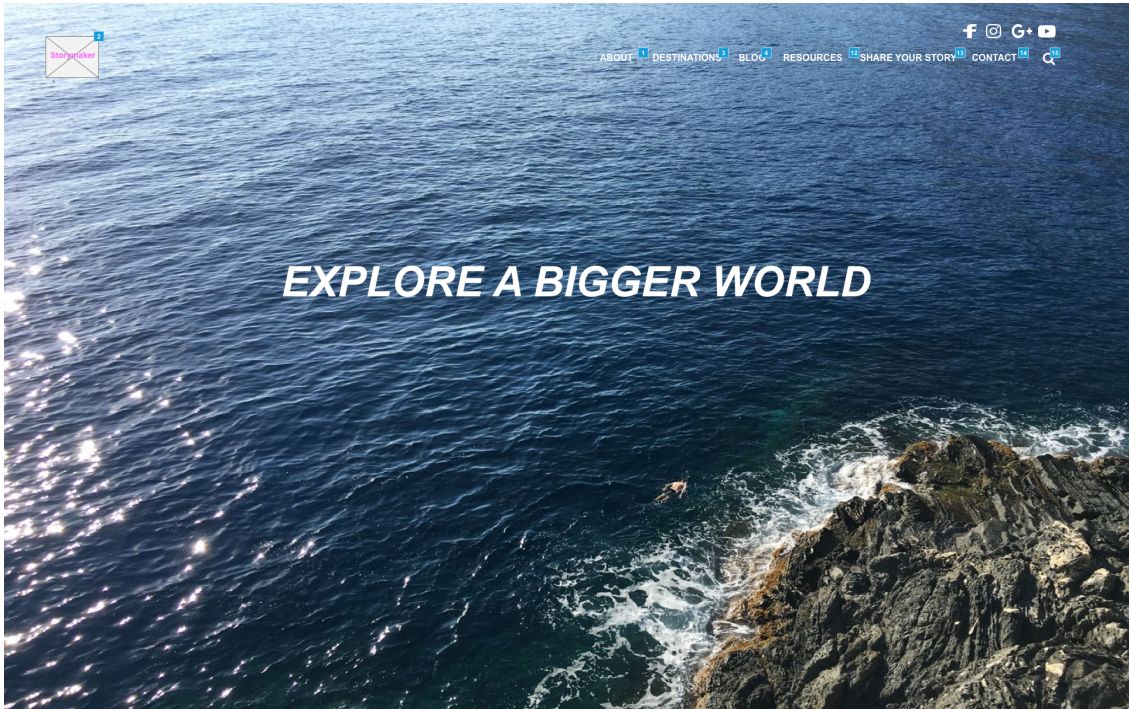
3.2.3 Prototype

The clickable prototype is the detailed demonstration of the final product that simulates the interaction between the user and the interface. The UI designer is responsible for maintaining the integrity of the user interface prototype and using the prototype to build a usable user interface. Comparing with wireframe and mockup, building a prototype is more time-consuming [19].

In this work, there are two versions of the prototype. The first version of user interface design was published on the Axure share platform: <https://se1wg3.axshare.com> . The final version was published as a link: <https://ni6fq0.axshare.com>.

The obvious differences of user interface design are header and footer on every page. In the beginning, the header was included in an image. Also, the header and the footer were of different styles because of the different background color (Figure 2). Considering the consistency of user interface design, the final version of design (Figure 3) was changed to use the same color and style in the header and footer. And the dark color style of the header made the navigation menu more clear on the top of image than the first version design of the header.

Figure 3 shows the blog website's home page, and this is the landing page.



INTRODUCTION...

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© Storymaker 2018

[HOME](#) [ABOUT](#) [DESTINATIONS](#) [BLOG](#) [RESOURCES](#) [SHARE YOUR STORY](#) [CONTACT](#)

FIGURE 2. Home page design in the first version

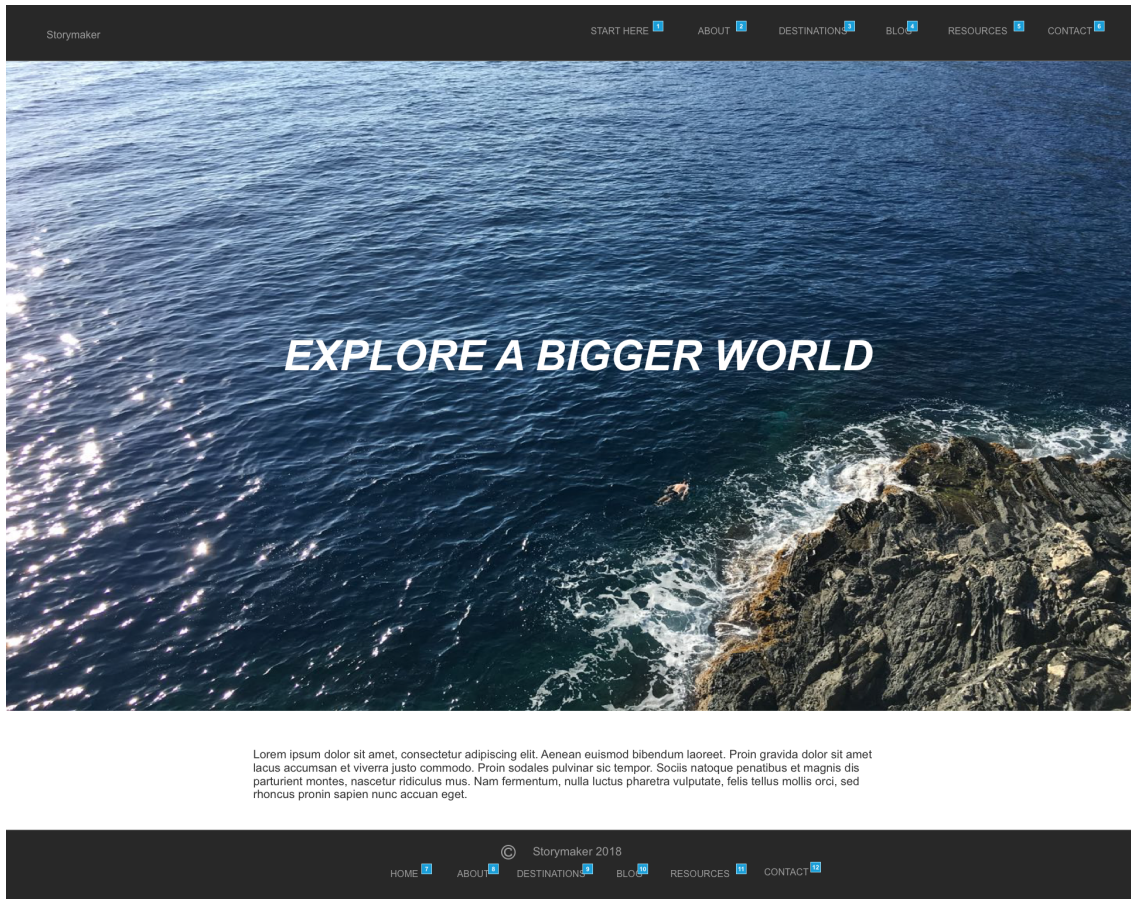
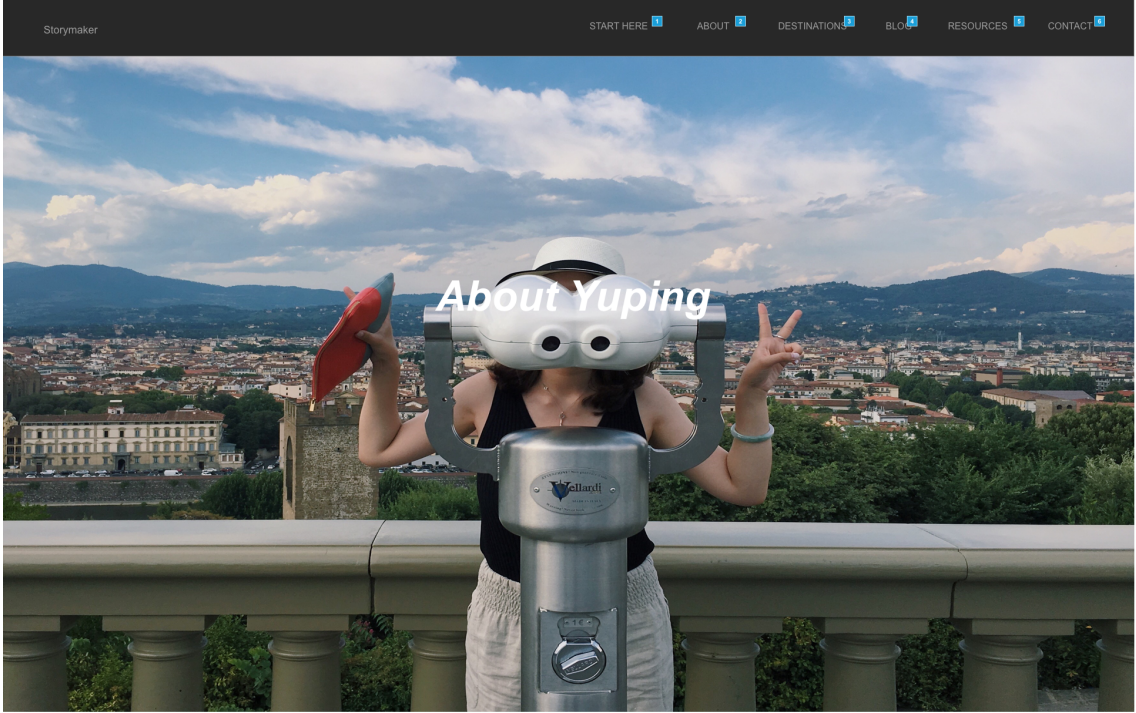


FIGURE 3. Start Here page design

In user interface design, the about page was used for the blogger's self-introduction and a detailed description about this travel blog (Figure 4). The image below the navigation bar is the same style as other pages. Users will have a better understanding of this blog website through the About page.



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Helsinki Sibelius Park

What is Storymaker?

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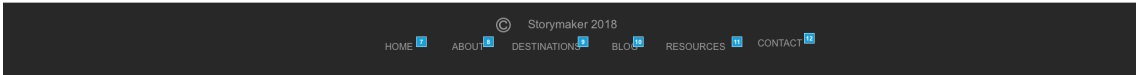
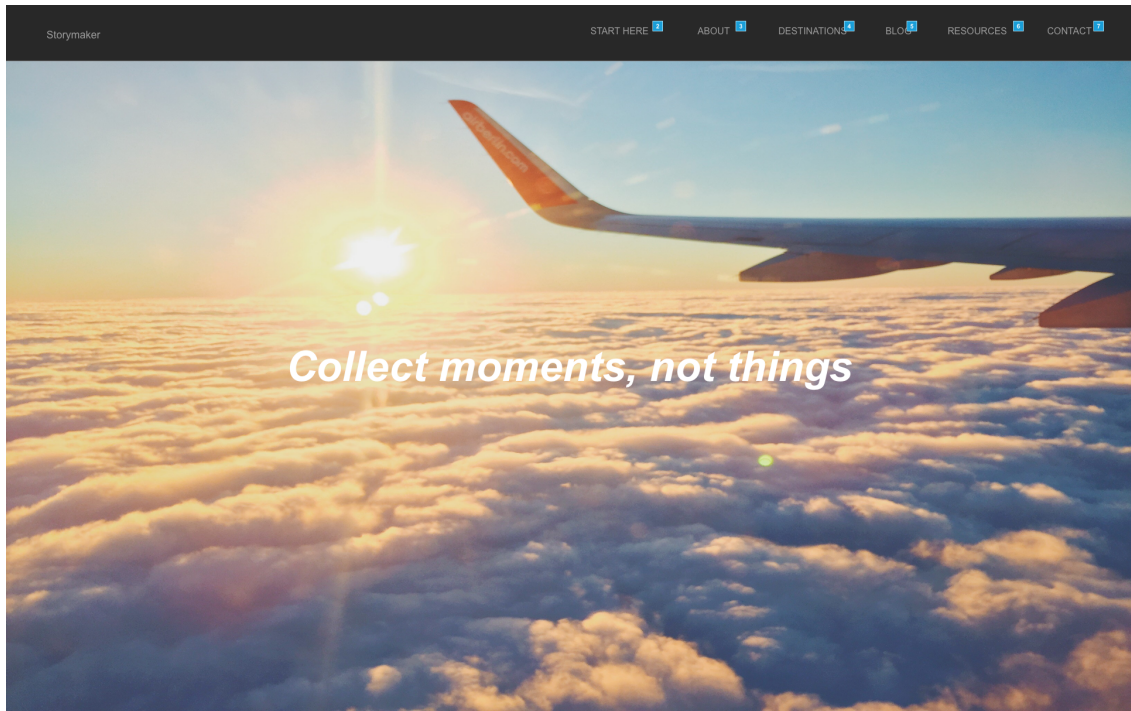


FIGURE 4. About page design

About the design of the destination page (see Figure 5), besides the same style of navigation bar and main image, the other part is the latest countries thumbnail photos that show images and stories from different countries all over the world. If the user clicks a certain country, then the current page will redirect to another certain country page.

According to the certain country page design (see Figure 6), the user can view the latest thumbnail images of travel. And if the user clicks a certain image, there will pop up a window which demonstrates a bigger image, the photographer, location and story description.

The pop-up window's design was displayed in Figure 7. Each image has a pop-up window to show the image and a story in different countries. The user can view a high definition travel picture and a detailed story through the window.



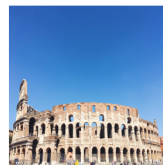
These country travel photos and stories will help you have a better understanding of local life and culture.



Finland



China



Italy



Denmark



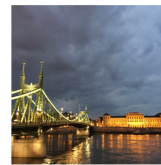
France



Netherland



Russia



Budapast

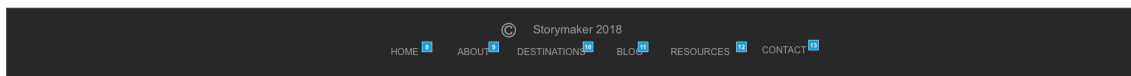


FIGURE 5. Destinations page design

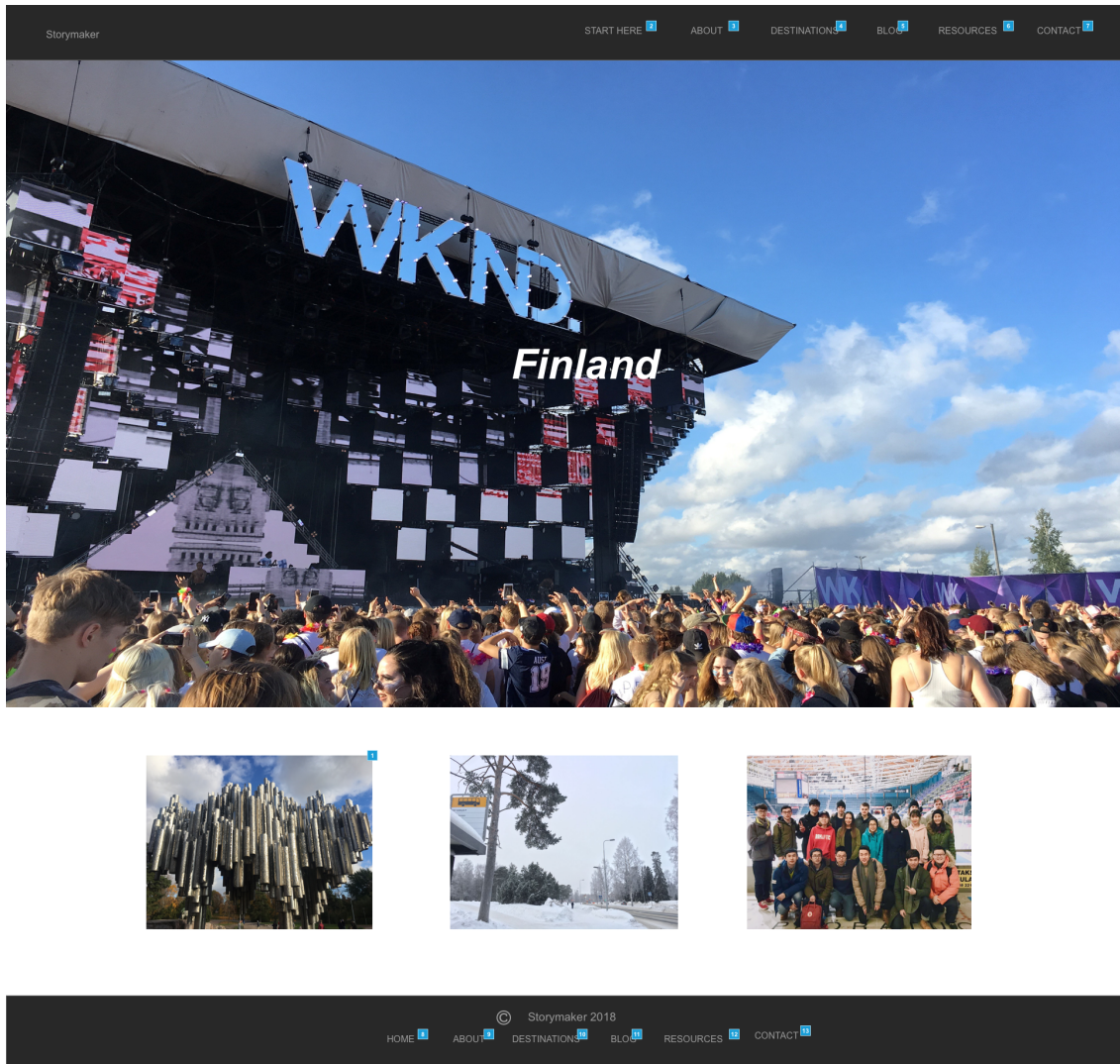


FIGURE 6. The certain country page design (Finland)

Yuping Feng Helsinki



The Sibelius Monument is located in the capital of Finland, Helsinki. I was went there in the Autumn of 2017. It's a quiet and fancy block, not so far from city center.

FIGURE 7. The certain story pop up window design

In user interface design, the blog page includes two vertical parts: a blog list part and a sidebar part (Figure 8). The blog list part contains the blog header, author's name, publish date, category, tag, comment, blog post thumbnail and a brief of the blog. And the sidebar part consists of a search area and some widgets about the blog. The user can retrieve useful information efficiently through these widgets.

The certain blog page was redirected from the blog page. If the user clicks the "Read more" link, then the certain blog page will appear (see Figure 9). The certain blog page was designed for the detailed description of blog. It includes the blog's full text, the comment area and the sidebar. The user can leave a comment about the blog, and other users also can leave a reply to a comment.

First blog

Lexi March, 2018 Italy, Travel Florene, Travel 1



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Search for:

Recent Posts

- Second blog
- First blog

Recent Comments

- Lexi on First blog
- Ines on Second blog

Archives

- March 2018

Categories

- Italy
- Travel

Second blog

Lexi March, 2018 Italy, Travel Florene, Travel 1



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FIGURE 8. Blog page design

First blog

Lexi March, 2018 Italy, Travel Florene, Travel 1



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Post navigation

[Second blog](#)

2 thoughts on "First blog"

Lexi says:
 March 2, 2018 at 7:00 pm Edit
 This is my first comment
[Reply](#)

Ines says:
 March 2, 2018 at 10:00 pm Edit
 This is my first reply
[Reply](#)

Leave a Reply

Your email address will not be published. Required fields are marked *

Comment

Name *

Email *

Website

Search for:

Recent Posts

- [Second blog](#)
- [First blog](#)

Recent Comments

- [Lexi on First blog](#)
- [Ines on Second blog](#)

Archives

- [March 2018](#)

Categories

- [Italy](#)
- [Travel](#)

FIGURE 9. Certain blog page design

In the design of resources page (Figure 10), it inherits the previous page's navigation bar and main image. Then, a paragraph used to introduce the resources page's purpose is below the image. The user can get some useful information and tips about airline companies, accommodation reservation tools and the local restaurant. Hence, this page was designed for sharing travel resources to users.

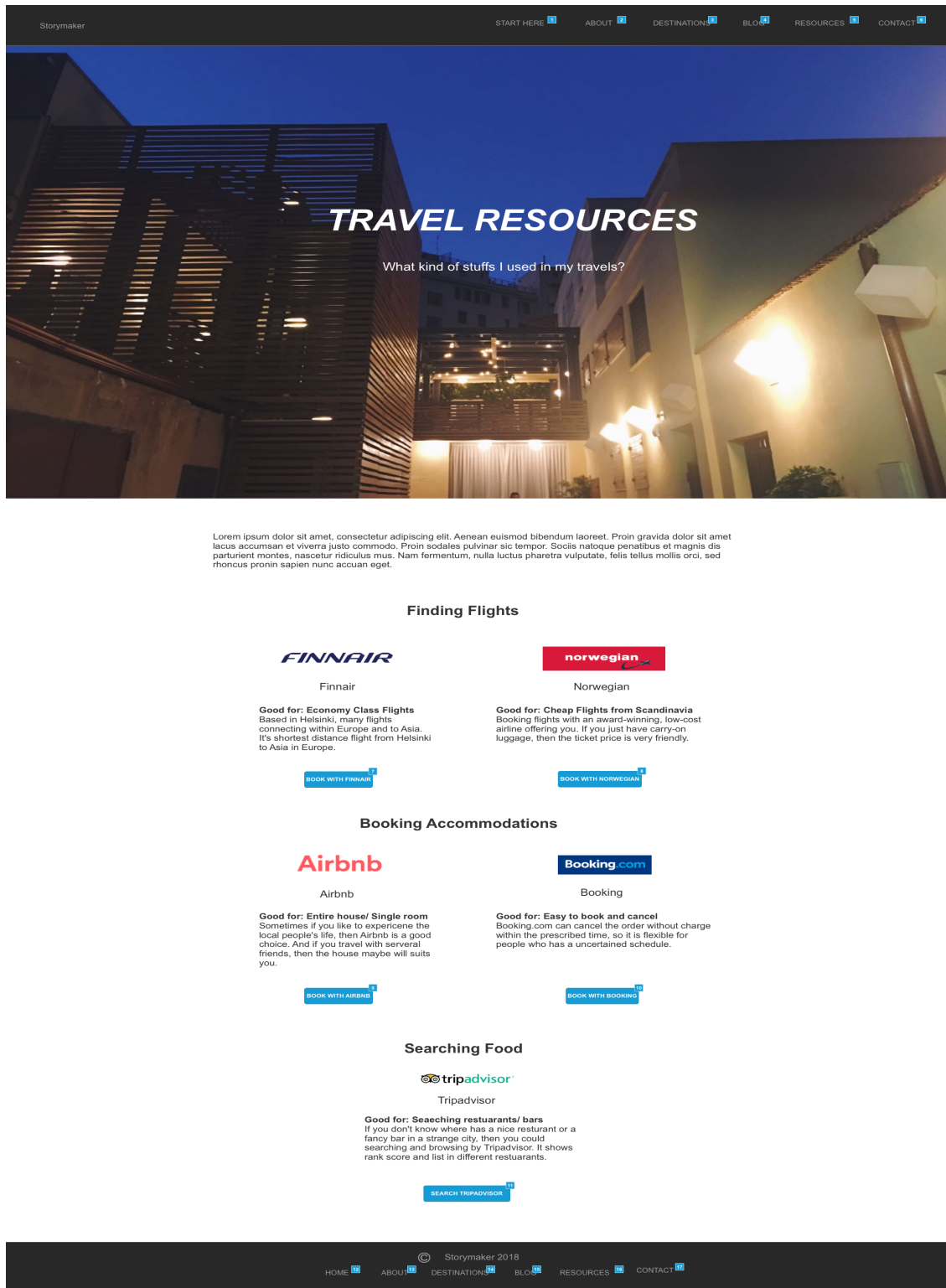


FIGURE 10. Resources page design

At the beginning of the user interface design, the share-your-story part and the contact part were on different pages separately (Figure 11 and Figure 12). The share-your-story part was utilized to encourage users to upload their own travel images and stories. And the contact page was just used for the user to leave a message.

However, in the final version of user interface design, the share-your-story part and the contact part were combined together as the contact page (Figure 13). Therefore, users can submit information on the contact page. Personal information and messages are necessary, but uploading the image and story are optional. The combination avoided the problem of content repetition on different pages. Thus, the user can use the functions efficiently.

Storymaker

ABOUT DESTINATIONS BLOG RESOURCES SHARE YOUR STORY CONTACT

f @ G+ YouTube

SHARE YOUR STORY

Welcome to contribute your travel experience to us, we will pick some interesting stories to post on our blog.

File 1

Description

Your name

Email

UPLOAD

© Storymaker 2018

HOME ABOUT DESTINATIONS BLOG RESOURCES SHARE YOUR STORY CONTACT

FIGURE 11. Share your story page design in the first version of user interface design



CONTACT ME

Thank you for your interest in contacting me!

Before contacting me, I would appreciate it if you would first take a look at my [RESOURCES](#) for travel tips.

Your Name (required)

Your Email (required)

Subject

Your message

[SEND](#)

FIGURE 12. Contact page design in the first version of user interface design

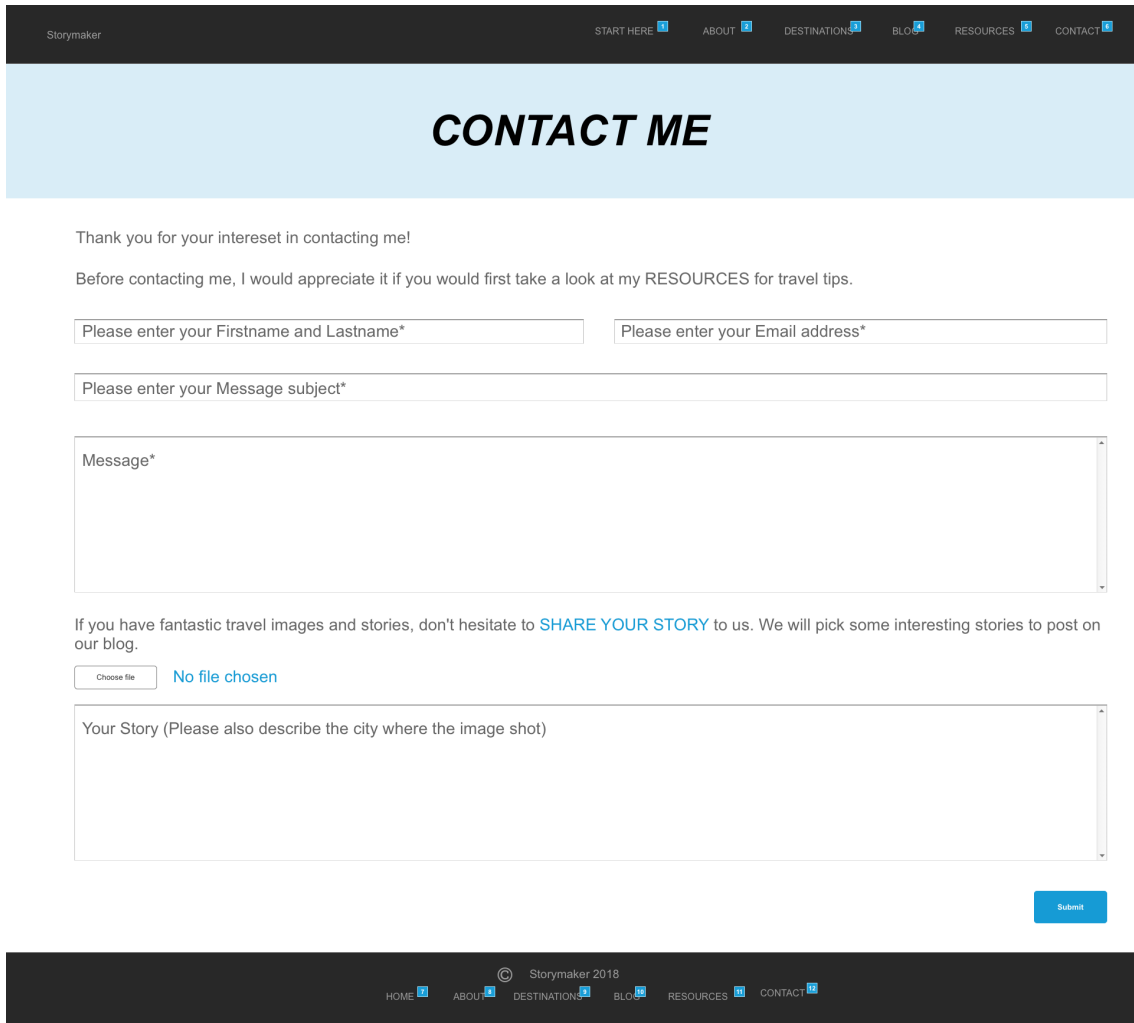


FIGURE 13. Contact page design in the final version of user interface design

4 IMPLEMENTATION

In this chapter, the implementation phase of the website will be introduced.

4.1 Setting up a server

The implementation phase was started by choosing the web hosting and domain name. HostGator was chosen as the web hosting service provider in the beginning. It also includes the service that registers the domain name. HostGator, as one of the top ten host companies in the United States, currently hosts more than 9 million domains and has over 400,000 customers. It is very friendly for a personal user due to the decent price [22]. A Hatchling plan was picked from hosting plan options, because it included a domain. yuping.co was chosen for the domain name used for the thesis project. With regard to .co, it is the Internet country code top-level of a domain assigned to Columbia. Meanwhile, in Japan, South Korea and some Commonwealth countries, the company domain name .com is replaced by .co frequently [23].

After the web hosting and domain name is paid, the HostGator system will provide an account about the Control Panel to the user. In the Control Panel which plays a role as a server management side, the user can manage files and install plugins.

4.2 Building a static website

In the beginning of the blog development, the static website of blog was built. These HTML files and assets were uploaded to the server after the website had been finished, and the home page file was uploaded as the index.html. Therefore, the static website's accessible URL is www.yuping.co.

4.2.1 Importing Bootstrap

The Bootstrap version 3.3.7 was used during the implementation. There are a few ways to import Bootstrap into website development, and Bootstrap CDN was chosen as a method to import in this study. The following lines of code display the CSS part of Bootstrap CDN.

```

<!-- Latest compiled and minified CSS -->
<link rel="stylesheet" href="style.css">
<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css"
integrity="sha384-BVYiisSIFeK1dGmJRAKycuHAHRg320mUcww7on3RYdg4Va+PmSTsz/K68vbdEjh4u"
crossorigin="anonymous">

```

According to the CDN code provided by the Bootstrap website: <https://getbootstrap.com/docs/3.3/getting-started/>, the Bootstrap front-end framework was applied to the blog website. jQuery and JavaScript parts of Bootstrap CDN codes were shown below. Apart from the CSS, jQuery and JavaScript of the Bootstrap package, the customized CSS file was utilized for the blog website as well.

```

<!-- jQuery (necessary for Bootstrap's JavaScript plugins) -->
<script
src="https://ajax.googleapis.com/ajax/libs/jquery/1.12.4/jquery.min.js"></script>
<!-- Include all compiled plugins (below), or include individual files as needed -->

<!-- Latest compiled and minified JavaScript -->
<script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"
integrity="sha384-Tc5IQib027qvyjSMfHjOMaLkfuWvXZxUPnCJA712mCWNIpG9mGCD8wGNiCPD7Txa"
crossorigin="anonymous">
</script>

```

4.2.2 Using CSS and Components of Bootstrap

When building the static website, the global CSS settings and reusable components of Bootstrap were used. Building the navigation bar was the first step to make the static website. Based on the final version of user interface design, the Bootstrap component inverted navbar including a class name *navbar-inverse* was used for the menu on every page of the blog website. Similarly, the tag *footer* was utilized for the footer on every page of the website. Overall CSS settings also included CSS classes *text-center* and *container*. About the background image on different pages, the Bootstrap component jumbotron including a class name *jumbotron* was used and it includes the following definition.

```

<div class="jumbotron text-center">
    <h1 class="leanFont title"><strong>EXPLORE A BIGGER WORLD</strong></h1>

```

</div>

The grid system was applied to adjust the size of the viewport or device when images were listed in the destinations page and the certain country page, and the component thumbnails including the class name *thumbnail* was applied to all image sections. In the next part, when the user clicked the post image on the certain country page, the CSS class *modal* was triggered to show the pop-up window. on the blog page, the grid system of CSS settings was also directed at dividing the blog content list part and the sidebar part. With respect to the search form of the sidebar part, the CSS classes *form-group* was employed in it. Moreover, the CSS classes *form-horizontal*, *form-group*, *form-control* and *btn* were utilized by the comment form part of the independent blog page. And Bootstrap tags *form*, *label*, *input*, *textarea* and *button* were also used for the comment part. Within the resources page, the grid system and component thumbnails including class name *thumbnail* were applied to build the sections of information and tips. The booking button used the Bootstrap tag *button* and CSS classes *btn* and *btn-info*. From the last contact page, the grid system and the CSS class *form-group* were used for the contact form. The Bootstrap tags *form*, *label*, *input* and *textarea* were also utilized for the contact form.

The main part's style of user interface was comprised CSS classes and components of Bootstrap version 3.3.

4.2.3 Importing CSS Font Awesome

Except for Bootstrap, the Font Awesome icon set library was used as well. Font Awesome provides scalable icons and social logos on the website. The size, color, shadow and other features of icon can be controlled by using CSS [24].

During the development of the blog website, the Font Awesome library was downloaded and placed in the assets folder on the server. Then in the blog and post of HTML files, the Font Awesome library was imported. There is a minor difference between the way of using the Bootstrap CDN and the way of importing the Font Awesome, and the only thing we need to do is to add one line of code below after downloading Font Awesome from the official website.

```
<link rel="stylesheet" href="assets/css/fontawesome/web-fonts-with-  
css/css/fontawesome-all.css">
```


Then, in the blog page and post page of website, the icon part utilized the Font Awesome library. It is very simple to insert the icon code into the HTML code as following lines of codes show. Different class names of icons can be found on the Font Awesome official website.

```
<i class="fas fa-user-circle"></i> Yuping Feng  
  
<i class="fas fa-clock"></i> <time>Feb 22, 2018</time>  
  
<i class="fas fa-folder-open"></i> <a href="/">Italy</a> , <a href="/">Travel</a>  
  
<i class="fas fa-tags"></i> <a href="/">Florence</a>, <a href="/">Italy</a>  
  
<i class="fas fa-comments"></i> <a href="/"> 0 </a>
```

4.3 Installing WordPress

The user can install the WordPress on the Control Panel easily because of the Marketplace of Control Panel includes WordPress. Figure 14 shows the user interface when the user is installing the WordPress on the Control Panel. Then in this thesis, “yuping.co” was chosen as the domain, and “wp” was chosen as the directory in the form.

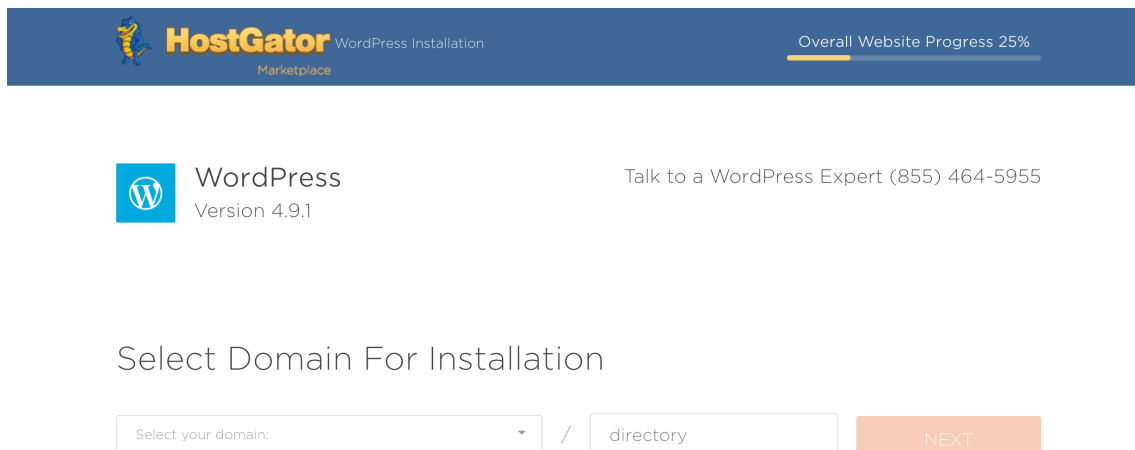


FIGURE 14. WordPress installation part1

In the next step, the user needs to fill the setting information. In this work, the travel blog’s information was filled as shown in Figure 15.

Install Settings

Blog Title	Admin User	First Name	Last Name
<input type="text" value="Storymaker"/>	<input type="text" value="Lexi"/>	<input type="text" value="Yuping"/>	<input type="text" value="Feng"/>
Admin Email			
<input type="text" value="lexi950302@hotmail.com"/>			
<input checked="" type="checkbox"/> Automatically create a new database for this installation			
By clicking install/import, you accept our			
<input checked="" type="checkbox"/> Terms of Service Agreement.			
			<input type="button" value="INSTALL"/>

FIGURE 15. WordPress installation part2

Finally, the installation was completed, and the system showed the website path, username and password (see Figure 16).

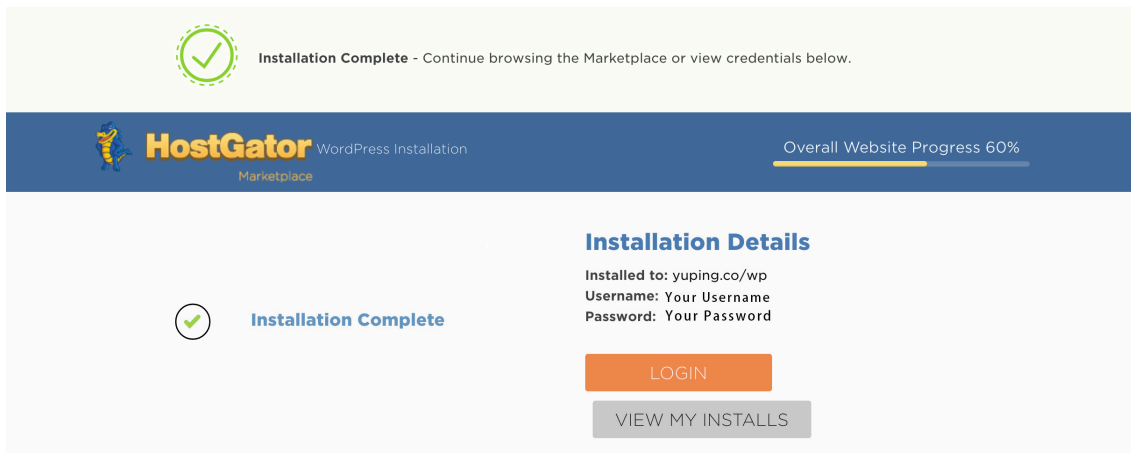


FIGURE 16. Installation complete

The developer can use the username and password to login to the WordPress admin system (see Figure 17). Generally speaking, the URL of WordPress admin system's login page consists of the website path and "wp-admin". For instance, in this study, the WordPress admin system's URL is www.yuping.co/wp/wp-admin.

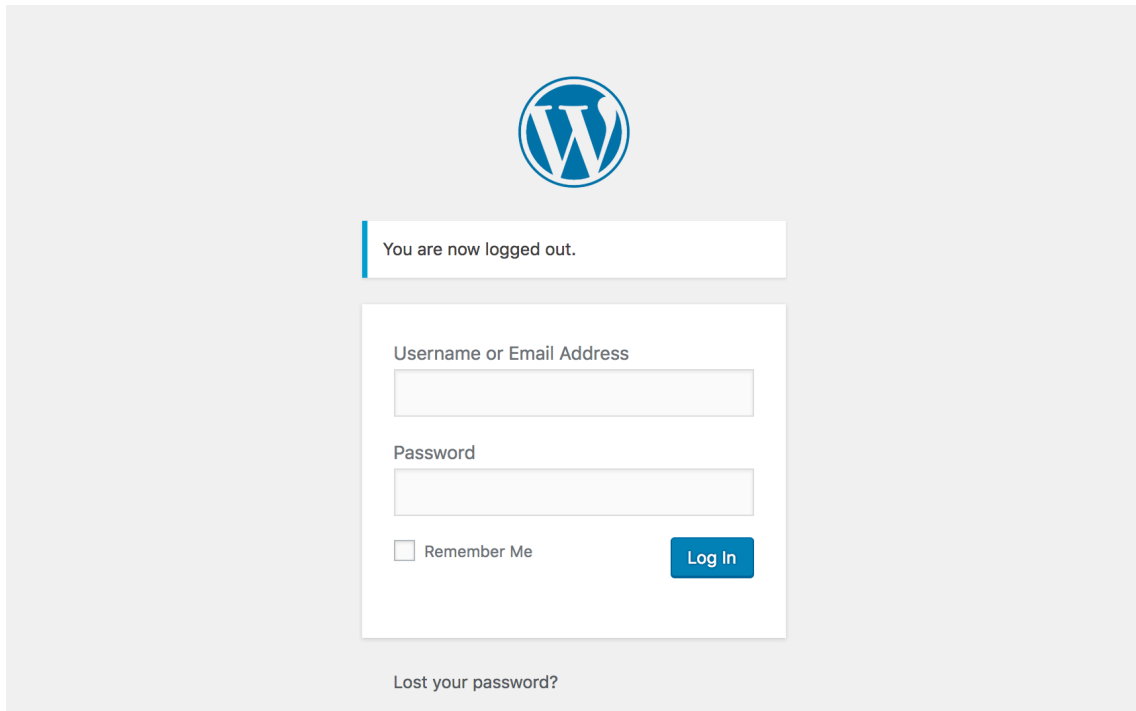


FIGURE 17. WordPress admin system login page

4.4 Converting to a dynamic website

The dynamic website refers to a website regulated by the application server that uses server technologies such as PHP, JavaScript or ASP, to process. There are some advantages about the dynamic website, firstly, it is easy to update. The content of website can be updated and modified through the customer's requirements quite easily at any time. Secondly, the dynamic website is more flexible and smoother to load a website. Then user can jump from one page to another without the cache problem of website. Lastly, the dynamic website can be responsive to any size of screen faster than a static website [25].

According to installation settings of WordPress, the dynamic blog website will be built on the URL www.yuping.co/wp.

4.4.1 Customized theme

After the WordPress has been installed in the directory named "wp" of the server, then there will appear a folder "wp" under the public_html folder on the File Manager of the Control Panel. All files

about the dynamic blog website will be saved in the folder “wp”. Moreover, all WordPress themes of the dynamic blog website will be generated in the folder path “public_html/wp/wp-content/themes”. In the corresponding WordPress admin page part, the themes are listed in the appearance of sidebar. The administrator can choose different user interface design styles of the website through change themes in the WordPress admin system.

Before this study, the author was unfamiliar with WordPress. Therefore, the author learnt from the tutorial by Ken Cen in the UdeMy platform. In this tutorial, Ken Cen provided a URL ken-cens.com/ken_cens_wordpress_theme.zip to share a documentation about WordPress theme’s template. After the template was downloaded, the author uploaded it to the folder path “public_html/wp/wp-content/themes” in the File Manager of the Control Panel. The user interface of the original template looks like the one shown in Figure 18.



FIGURE 18. The user interface of original template

This is the beginning of creating a customized theme. Next, the theme name was renamed as YupingTheme. Besides, operations about the blog dynamic website will influence the structure of the files in the folder YupingTheme (see Figure 19).

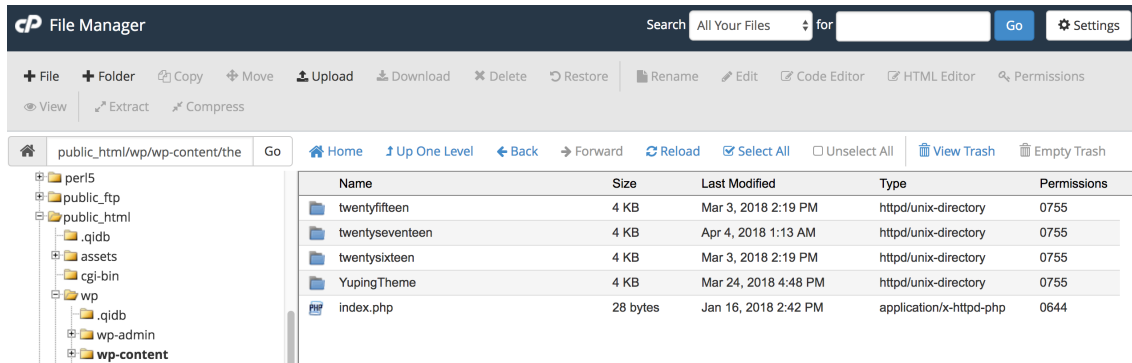


FIGURE 19. Customized theme in the File Manager of Control Panel

Figure 19 shows where the customized theme was placed in Control Panel. Furthermore, the WordPress admin page will display the added theme automatically after the theme has been uploaded to the server. YupingTheme was chosen to be the active theme in the WordPress admin system. Figure 20 indicates how to activate themes in the WordPress admin system.

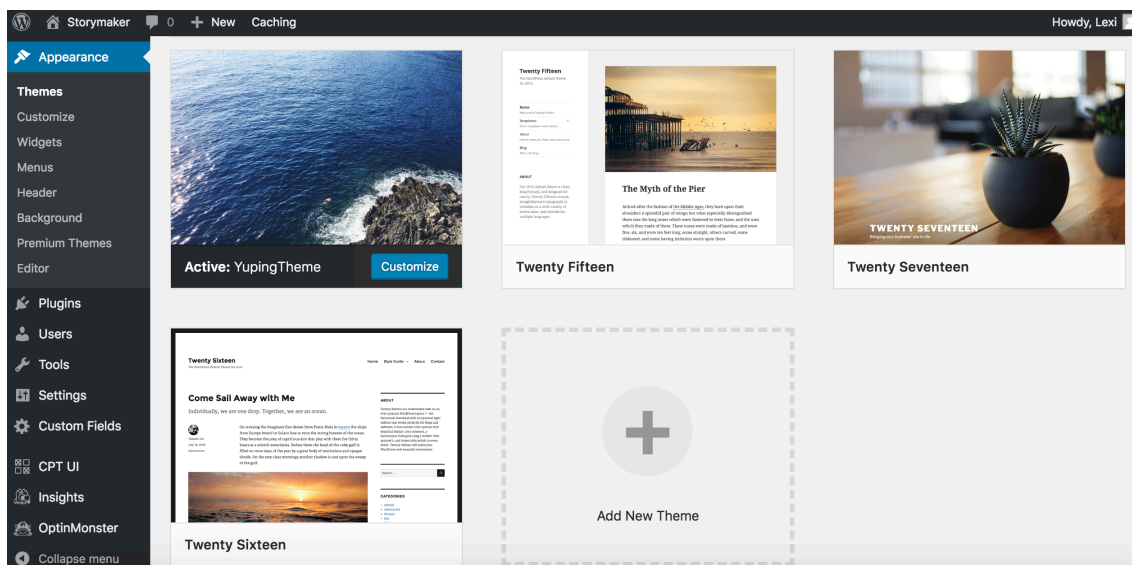


FIGURE 20. Customized theme in the WordPress admin system

4.4.2 Transforming the Start Here page into a dynamic page

Navigation bar part

The Start Here page is the landing page of the blog website, and the first step of transformation is the converting navigation bar. On the basis of the theme template, header.php is the file that controls the navigation bar. Then, in order to enable the WordPress system allowed to find the Font Awesome library, a block of improved code importing Font Awesome library was also used in the file header.php. The following code includes a PHP function *bloginfo*.

```
<link rel="stylesheet"
href="<?php bloginfo(stylesheets_directory); ?>/assets/css/fontawesome/web-fonts-with-
css/css/fontawesome-all.css">
```

After that, the code within the header tag was ported from the static Start Here page. Then, a PHP part including a WordPress function *wp_nav_menu* was added in HTML header tag (see Figure 21).

```
<?php
    wp_nav_menu(array(
        "theme_location" => "primary",
        "container" => "div",
        "container_class" => "collapse navbar-collapse",
        "container_id" => "navbarNav",
        "menu_class" => "nav navbar-nav navbar-right",
    ));
?>
```

FIGURE 21. PHP function in the header.php file

Function *wp_nav_menu* was used to generate the attributes of the dynamic navigation bar instead of using the HTML code in the static website. Then, changing settings accordingly in the WordPress admin system was followed. The primary navigation bar of the blog website was also created in sidebar-appearance-menus of the WordPress admin system. After that, the documentation function.php, which contains all external functions was changed. In the function *register_nav_menus*, *menu-1* was replaced with *primary* (see Figure 22). Therefore, the administrator can select display location of different menus in the WordPress admin system.

```

// This theme uses wp_nav_menu() in one location.
register_nav_menus( array(
    'primary' => esc_html__( 'Primary', 'yuping.co' ),
    'footer' => esc_html__( 'Footer Menu', 'yuping.co' ),
) );

```

FIGURE 22. Function `register_nav_menus` in the `function.php` file

Finally, structure and settings of navigation bar can be controlled through the menu section in WordPress admin system. That is the process how to make the navigation bar be dynamic. Moreover, the documentation `header.php` can use in different PHP files by function `get_header`.

Footer part

The next stage after converting navigation bar to be dynamic was converting page footer to be dynamic. The method was similar between converting these two parts to be dynamic. In theme's template, file `footer.php` was the file which controls footer. The first step was to port footer part's HTML code from static website. The second step was to modify function `register_nav_menus` in file `function.php` (see Figure 22) and function `wp_nav_menu` in file `footer.php` (Figure 23). The last step was to set and edit footer menu in WordPress admin system. Function `get_footer` can be included in various pages' code as well.

```

<?php
    wp_nav_menu(array(
        "theme_location" => "footer",
        "container" => "nav",
        "menu_class" => "list-inline col-xs-12",
    ));
?>

```

FIGURE 23. PHP function in the `footer.php` file

Content part

With respect to the transformation of content on the Start Here page, initially, a PHP file `page-starthere.php` was created under the folder `YupingTheme` in the Control Panel. Then, in the WordPress admin system, the corresponding operation was to add a page named Start Here. The PHP part's functions `get_header` and `get_footer` were added to the file `page-starthere.php` to build the structure of the Start Here page. Except the `get_header` function, the PHP tag in the first part of file `page-starthere.php` also included template name definition and some variables definitions (Figure 24). The template name definition was used to select a template of page attributes in the WordPress admin system.

```
<?php
/*
    Template Name: Start here Page
*/

    $main_slogan = get_post_meta( 8, "main_slogan", true);
    $start_introduction = get_field("start_introduction");
    $thumbnail_url = wp_get_attachment_url( get_post_thumbnail_id( $post->ID) );

    get_header(); ?>
```

FIGURE 24. PHP tag of file `page-starthere.php` in the Control Panel

Title of content part

Besides, the variable `main_slogan` and function `get_post_meta` were utilized for the dynamic title. The administrator used a section Custom Fields to define an attribute name and a corresponding value on the Start Here page of the WordPress admin system (Figure 25). The function `get_post_meta` included three parameters (see Figure 24), `8` means what the post number equaled on the Start Here page of the WordPress admin system. On the Start Here page of the WordPress admin system, `main_slogan` was defined for a parameter name in the Custom Fields section (Figure 25). In regard to the parameter `true`, if the return value is a single value, then the parameter should be `true`, otherwise the parameter should be `false`. As the return value shows in Figure 25, the third parameter of the variable `main_slogan` was `true`.

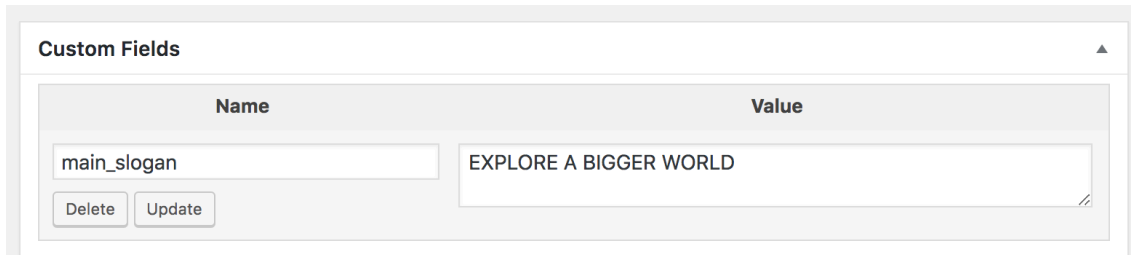


FIGURE 25. Section Custom Fields on the Start Here page of the WordPress admin system

After variables had been defined, they could be called in where needed. For instance, the function *echo* can output the variable *main_slogan* in the PHP tag which was involved in the HTML code (Figure 26). On the whole, the process of converting a title to be dynamic will be completed. The administrator is able to update the title of the Start Here page in the WordPress admin system easily.

```
<?php if( has_post_thumbnail() ) : ?>
    <div class="jumbotron text-center"
        style="background: url('<?php echo $thumbnail_url ?>'); background-size: cover; " >
        <h1 class="leanFont title"><strong><?php echo $main_slogan ?></strong></h1>
    </div>
<?php else : ?>
    <div class="jumbotron text-center">
        <h1 class="leanFont title"><strong><?php echo $main_slogan ?></strong></h1>
    </div>
<?php endif; ?>
```

FIGURE 26. Background image part code in the file *starthere.php*

Background image of the content part

On the page Start Here of the WordPress admin system, there is a section used to set a featured image. Then, the system will check whether the image exists through the PHP function, so that the background image will update on the website if the image exists. According to Figure 26, the if statement in the PHP code was used for inquiring whether post thumbnail exists. If yes, the background image's URL will update, if no, it keeps as before. A CSS inline style was added in where the image setting is located (see Figure 26), and a PHP function *echo* was added into the CSS inline style to output a variable *thumbnail_url*.

At the same time, the variable *thumbnail_url* needs to be defined in the PHP tag of the beginning part of the file *starthere.php* (see Figure 24). A specific WordPress function *wp_get_attachment_url* utilizing for obtaining the image path was applied to the variable *thumbnail_url*. The other PHP function *get_post_thumbnail_id* was used for acquiring a dynamic attachment ID number as well. In the function *get_post_thumbnail_id*, the parameter *post->ID* indicates what is the image ID that was published in the page setting of the WordPress admin system. After that, if the administrator sets or changes the featured image on the Start Here page setting of the WordPress admin system, the background image will be updated on the Start Here page of the blog website.

Paragraph of the content part

With regard to the complex content, such as images and paragraphs, the custom fields of the native function were not enough. Thus, the plugin Advanced Custom Fields was installed and activated in the WordPress admin system. Firstly, a new field group named *start_here_section* was built on the section Custom Fields through the sidebar menu in the WordPress admin system. In the location section of editing field group setting, the field group *start_here_section* will be shown if the page is equal to Start here. Moreover, a new field was added in the field group *start_here_section* and the field label and field name were named as *start_introduction*. The field type was set as text. Secondly, a variable *start_introduction* was defined in the PHP tag of the beginning part of file *starthere.php* (see Figure 24). The PHP function *get_field* was used for obtaining information through the corresponding field name which was defined in Tool Advance Custom Fields. Finally, the administrator is able to edit or update the paragraph on the Start Here page through the WordPress admin system efficiently (Figure 27).

The process of converting rest of the pages to be dynamic is similar to the process transforming of the Start Here page to be dynamic. It is worth mentioning that the Start Here page was set as a Homepage, and the Blog page was set as a Posts page in the WordPress admin system. These were used for setting the priority of website reading.

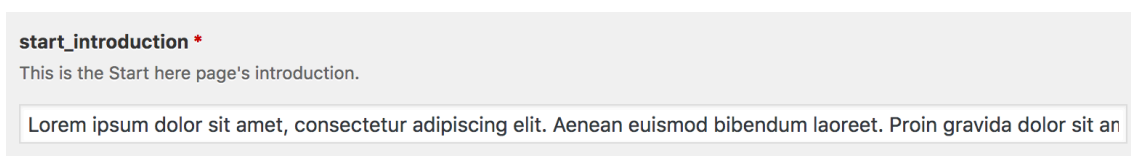


FIGURE 27. Controlling paragraph section on the Start Here page of the WordPress admin system

4.5 Features

WordPress is powerful because of its good extensions, numerous themes, and plugin support. Apart from the original features of WordPress, some external plugins were used during the process of developing the blog website in this study.

4.5.1 Advanced Custom Fields

Advanced Custom Fields is a powerful plugin to customize a field. It allows adding multiple forms of custom field types, for example, image, text, checkbox, or text area. Furthermore, this plugin requires basic PHP code editing capabilities. The file in theme panel needs to be modified to display fields. The process of a detailed operation was demonstrated in the previous section of this chapter. In addition, there is an example in Figure 28.

Figure 28 illustrates the structure of a field group *about_section* which was used for converting the About page to a dynamic one. Field group settings included some field labels definitions, location where the field group was used and other options.

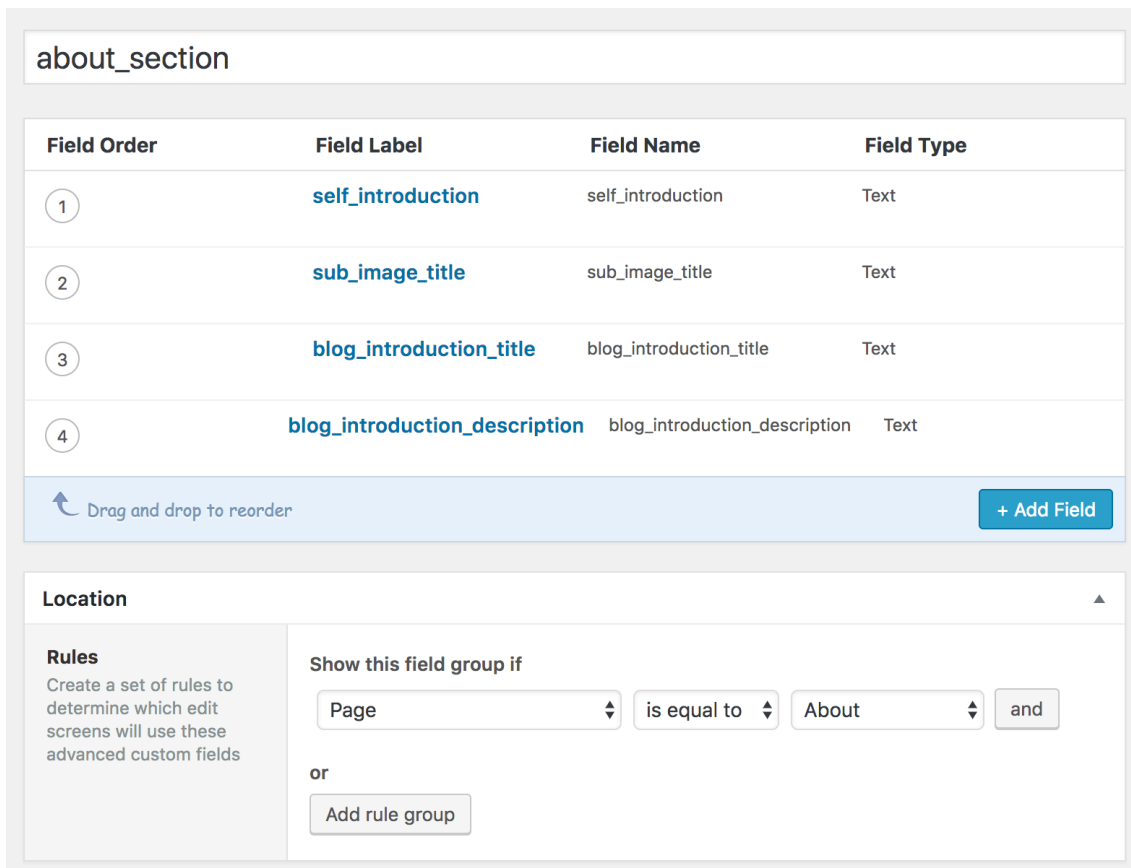


FIGURE 28. User interface of the plugin Advanced Custom Fields

4.5.2 Contact Form 7

Contact Form 7 is a very popular custom contact form plugin of WordPress. After website visitors have entered the contact page, input the form content and submitted it, Plugin Contact Form 7 will send the filled form information to the administrator's default mailbox automatically.

Contact Form 7 is very easy to use. The administrator only needs to use the simple built-in tags to customize the form and email the content flexibly. Supported tags include text field form, date, drop-down menus, check boxes and upload files. In this study, text tag, email tag, text area tag, file tag and submit tag were used for the Contact page's form of the blog website (Figure 29).

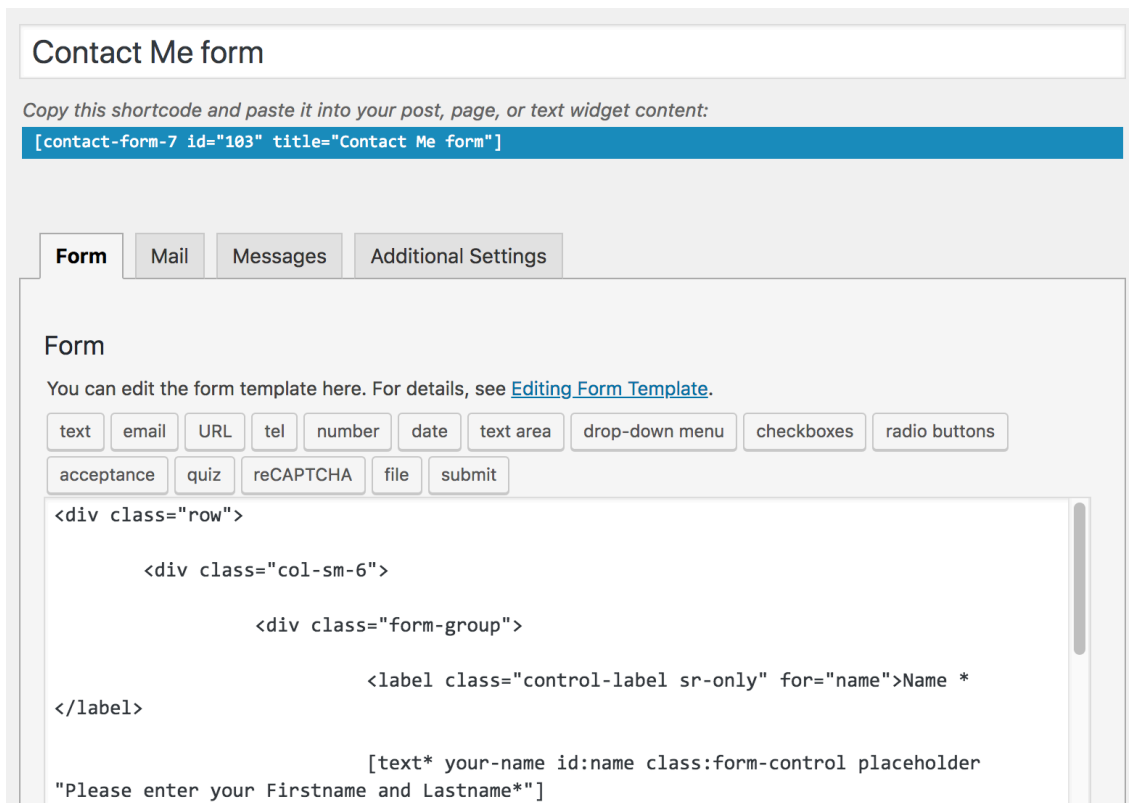


FIGURE 29. User interface of the plugin Contact Form 7

4.6 Testing

In short, the concept of website testing is checking if the website contains latent errors before they will be published. At this stage, website security, operation of website, visiting by disabled people and normal user, and capacity of processing flow will be checked [26].

In this thesis, the website security and capacity of processing flow are in charge of WordPress conveniently. Moreover, website features and usability were tested by the administrator. After the website's implementation part has been done, the blog website is responsive for different screen sizes of mobile devices. Thus, the website becomes more user-friendly at present.

The main feature of the blog website is that a visitor can upload images and stories to the website, then the administrator can receive messages from visitors. After testing, this feature works correctly, the administrator's mailbox can receive what the visitor has uploaded (Figure 30).

From: Test <test@hotmail.com>
Subject: Test

Message Body:
Test

The Story:
Venice

--

This e-mail was sent from a contact form on Storymaker (<http://yuping.co/wp>)

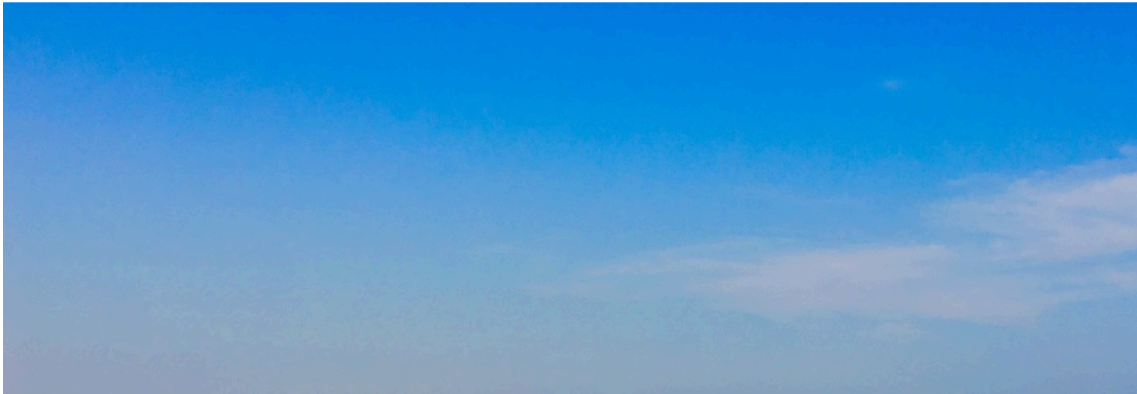


FIGURE 30. Contact information submit function test

The testing about disabled people reading was made as well. As Figure 31 shows, when a mouse is moved on the text field that inputs name, the computer system will remind the visitor what should be input through voiceover.

CONTACT ME

Thank you for your interest in contacting me!
Before contacting me, I would appreciate it if you would first take a look at my RESOURCES for travel tips.

Please enter your Firstname and Lastname*

Please enter your Email address*

Please enter your Message subject*

Message*

× Name *, required, edit text, Please enter your Firstname and Lastname*

FIGURE 31. Disabled people reading test

5 CONCLUSION

In this thesis, I studied developing a blog website using a customized WordPress theme by web technologies. The first step was designing a user interface, the second step was implementing a static website, the last step was building a customized theme. Before this thesis, I had minor knowledge about WordPress. The only thing I knew was that WordPress is a popular tool. However, a developer needs to have an understanding of comprehensive latest technologies and tools. Thus, I chose WordPress as my studying topic.

During the design of the user interface, I reviewed the process of user interface design. Then I investigated other successful blogs to learn how to make the user experience of website more user-friendly. After that, I created a unique user interface design for the travel blog website through a decent tool, Axure RP. For the static website, I implemented a whole website including nine pages. However, this static website without features due to the theme was customized and features were achieved through WordPress. Web technologies Bootstrap and Font Awesome library were used for building the user interface. The key part was creating a customized theme and I explored the structure of a WordPress theme. Then, the static website was converted to a dynamic website through the customized theme. PHP knowledges were applied to build the customized theme. Some user-friendly WordPress plugins were detected as well.

During this thesis work, I learnt that WordPress has a powerful Content Management System including many themes and plugins. WordPress can achieve many types and purposes of website because of these different kinds of plugins and theme library. This blog website, the purpose focuses on sharing travel stories, images and information with others all over the world.

Although I had done a lot of projects during previous studies, I rarely did a project by myself. However, in this thesis study, I took a responsibility for the front-end development and back-end development. Hence, I learnt a lot during the website development, such as how to solve a problem and how to overcome a difficult part.

In the future, there remain many functions and plugins of WordPress that are worth to learn. Besides, the travel blog website www.yuping.co/wp will be updated in the future. Due to a lack of

time, some parts of the website did not convert to be a dynamic content. If I have time to complete it in the future, I will try to upload YupingTheme to WordPress.org.

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