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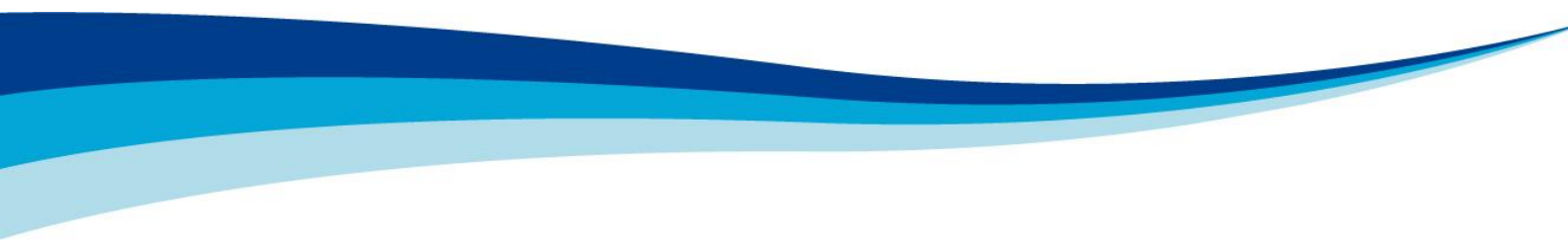
A WEBSITE TO SELL DIGITAL IMAGES ONLINE

– An initial step towards the vast e-commerce world



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BACHELOR´S THESIS | ABSTRACT
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A WEBSITE TO SELL DIGITAL IMAGES ONLINE

E-commerce happens everywhere from developed countries to developing ones, and is becoming an essential part of business nowadays.

This Bachelor's thesis is about developing an e-commerce website in English in the Wordpress platform to sell digital images under royalty-free license. This website serves a personal business purpose and all images on sale are fully legal and they are taken personally by the owner of the website.

There are two theoretical parts inside the thesis. The first one covers self-research about features, types, and trends of e-commerce in general. The second part concentrates on researching about how selling online digital images operates and what legal infrastructure it is based on.

The development part covers technical issues of building a website, from choosing suitable e-commerce platform, selecting domain and hosting service to customizing the website's interface and protecting images. This part also describes all steps required to submit an image from personal computer to be a product on sale online.

By combining photography as hobby, business spirit, and information technology knowledge, the thesis results in launching a personal e-commerce website, where products are digital images. The development progress of the AvBpix website took place from September to November 2013.

KEYWORDS:

E-commerce, Wordpress, Symbiostock, Microstock, Royalty-Free, Internet Marketing

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LIST OF ABBREVIATIONS

B2C	Business to Consumer
CMS	Content Management System
CSS	Cascading Style Sheets
HTML	Hypertext Markup Language
MySQL	SQL: “Structured Query Language”
PHP	“Personal Home Page”, a programming language
SSL	Secure Sockets Layer

1 INTRODUCTION

1.1 Thesis motivation

The rapid growth of the internet technology and its infrastructure has been pushing every individual, who has network connecting ability, into the flow of e-commerce. Nowadays, most people can access the Internet to sell almost everything through third-party websites such as eBay and Amazon once they accept and follow these websites' rules and regulations. Other people might take their own risks to build their own commercial websites with their own information technology skills, or by using web-design services.

Marc Ostrofsky, an online entrepreneur who earned over 50 million USD through domain investing in 20 years (Sachs 2011), pointed out on an interview with TIME Business in 2011 that:

> "Number one, you can sell before you buy. I call it reverse e-commerce. You take an image, you list it for sale, you sell it, you collect the revenue, then you go buy it and send it to the customer."

His main idea was about the high convenience and widespread expanse of affiliate marketing online in the global e-commerce. The seller lists items on his e-commerce websites and transfers orders to his or her third parties to create the desired products and those parties could deliver the products under the seller's name directly to the buyers' door. In the end, the seller gets profits and does not have a warehouse or any producing line.

The author was greatly inspired by the advantages and the potential of e-commerce and decided to start a project which contains a combination of three elements. They are the ability to apply the IT skills learnt from school, together with the interest of researching of e-commerce, and accompanied by the author's photography hobby.

This project is about creating a website to sell digital images online. The images are taken by the author and his wife and friends. The choice for the website's

platform is Wordpress.org, one of the most powerful e-commerce platforms nowadays, and a Wordpress theme called Symbiostock, which is designed for selling online photos on personal websites.

1.2 Project scope

In order to set up and manage a website to sell digital images in the real world, web design skills are not enough. Essential and fundamental knowledge should include several business fields such as internet marketing and advertising, financial management and online payment security. Furthermore, to protect images as the products, the author is required to have a basic understanding of license laws as well as the Rights of Publicity.

Limited by his financial situation, by the researching time and capability, the author decided to narrow down the scope of this project into four segments:

- Researching basically current situation of e-commerce and its trends in near future
- Understanding the legal aspect of selling digital images online
- Applying online digital image protection methods
- Creating the website with his own domain

1.3 Thesis structure

The above four-segment divide played its roles as the main frame of this thesis. Therefore, besides the first chapter which introduces an overview to the project, the thesis would be divided into four chapters, which cover these segments in details.

Chapter 1. Introduction

A general view about the thesis as a project.

Chapter 2. E-commerce Overview

The second chapter elaborates on e-commerce's main features, types of e-commerce, and which type the project's website belongs to. Upcoming trends of e-commerce will also be mentioned and analyzed in a general approach.

Chapter 3. E-commerce of Digital Images

The third chapter will narrow down the world of e-commerce into a more focused extent. Related aspects discussed in this chapter, include in what business models digital images are sold and in which type of licenses they are classified. The author will research legal issues of selling digital images from online agencies and apply them into his own website with modifications if needed.

Chapter 4. Website Development

In this chapter, the progress of building the website from start to finish will be noted down. It includes the choice of e-commerce platform, website hosting, and other technical aspects like how to protect online images or how to successfully submit images on sale. After the website is built, it will be put in full load test in different web browsers and once it passes the test, its launching will begin.

Chapter 5. Further Development

After launching the website, the author will briefly describe some challenges related to technical issues as well as in marketing strategies, which the website will have to face in the future.

2 E-COMMERCE OVERVIEW

2.1 Definition

The initial step before stepping into the world of online business is to understand what that world is, which characteristics might exist, and how it will evolve in about at least five years later. In general, fundamental knowledge is indispensable to start the project with.

E-commerce stands for electronic commerce, and is widely understood among Internet users as transactions happening online. These kinds of transaction include: buying products from websites, ordering services from online service organizations, and selling products to online buyers through online trading websites like e-Bay. However, the world of e-commerce is not that simple person-to-person or individual-to-organization transaction. That world should be comprehended at a widen extent. The online Oxford dictionary defines e-commerce as: “commercial transactions conducted electronically on the Internet” (Oxford Dictionaries).

While the definition from the dictionary is quite concise, Dave Chaffey (2011, 10), an e-commerce consultant, pointed out in his course book that e-commerce involves not only *financial* transaction but also *all* transactions between an organization and any third party which occur over the Internet. Therefore, e-commerce should include activities that happen before and after selling or buying any item online.

2.2 Features of e-commerce

Nowadays, studying e-commerce is gaining much more interest and is attractive to all people. To answer why e-commerce technology is a phenomenon and a challenge to traditional ways of doing business, Kenneth C. Laudon and Carol Guercio Traver (2012, 51) draw seven key features that are the secrets behind its success, not to mention its uniqueness.

2.2.1 Ubiquity

Ubiquity means existence or availability everywhere at all times. Unlike the traditional marketplace, which is limited by its physical and visible space and location, in the e-commerce world, participants are able to connect and do business with each other via connected mobile devices anywhere at any time. This feature is supported by the high-speed development and expansion of the Internet and Web technology. Since 2000, the Internet world's population has been increasing dramatically and relentlessly – at 566.4% growth from 2000 to 06.2012, as shown in Table 1.

Table 1. World Internet usage and population statistics. (Internet World Stats, 2012)

WORLD INTERNET USAGE AND POPULATION STATISTICS 30-Jun-12						
World Regions	**Population (2012 Est.)**	**Internet Users Dec. 31, 2000**	**Internet Users Latest Data**	**Penetration (% Population)**	**Growth 2000-2012**	**Users % of Table**
Africa	1,073,380,925	4,514,400	167,335,676	15.60%	3606.70%	7.00%
Asia	3,922,066,987	114,304,000	1,076,681,059	27.50%	841.90%	44.80%
Europe	820,918,446	105,096,093	518,512,109	63.20%	393.40%	21.50%
Middle East	223,608,203	3,284,800	90,000,455	40.20%	2639.90%	3.70%
North America	348,280,154	108,096,800	273,785,413	78.60%	153.30%	11.40%
Latin America / Caribbean	593,688,638	18,068,919	254,915,745	42.90%	1310.80%	10.60%
Oceania / Australia	35,903,569	7,620,480	24,287,919	67.60%	218.70%	1.00%
WORLD TOTAL	**7,017,846,922**	**360,985,492**	**2,405,518,376**	**34.30%**	**566.40%**	**100.00%**

Thanks to this growth, at the present time, over one-third of world's population can access the Internet and experiences e-commerce technology through desktops, notebooks, mobile phones or tablets. The hyper-growth of smartphones creates a subset of e-commerce, which is known as mobile commerce or *m-commerce* in short. Similar to m-commerce, the Internet world has welcomed *t-commerce* since iPad tablets were introduced in 2010.

Ubiquity lowers both *transaction costs* and *cognitive energy* for consumers (Laudon 2012, 52). Transaction costs include traveling costs and time spending to reach the marketplace. Cognitive energy – themental effort needed to finish a task-, is reduced because people can search and order their wanted products online, rather than rushing into different stores to hunt for them.

2.2.2 Global Reach

Industries like television and newspaper, without being published over Internet, are limited by localness, and are difficult to expand to worldwide audiences (Laudon 2012, 53). Benefiting from the Internet technology, e-commerce enables an organization to easily reach across national boundaries and throughout cross cultures and sets up a global business network.

For an example, Rovio Entertainment Limited, based in Espoo, Finland, has done a "massive global reach across all territories" (Pearce 2013) with its flagship bird-flinging game series Angry Birds. Over 1.7 billion download times from all platforms and around 263 million people active playing are enormous numbers, which could happen merely in the era of e-commerce.

In the world of e-commerce, *global reach* is measured by the total number of people that can obtain and share the information (Evans, 2000, 23). For Rovio, their global reach is exactly the number of download times on and off the Internet.

Indeed, global reach is an index showing of a company's success across the e-commerce world. The higher score that index displays, the more potential

customers a company could obtain, and of course, the more success it has been achieving.

2.2.3 Universal Standards

Universal or international standards are standards that are shared and implemented by almost all countries. There are many universal standards developed by several international standard organizations. One of them is the ISO standard, the common name for standards created by the International Organization for Standardization (ISO), which are applied so broadly around the world that people sometimes forget about their existence. For instance, when taking an image, film speed or ISO speed plays a very important role in the image quality. Currency codes USD or EUR are also based on ISO standards.

In the Internet world, W3C – World Wide Web Consortium is a universal standard created in order to standardize the Web, and usually called as W3C Recommendations. When a website is designed in the HTML language, the <!DOCTYPE> declaration, which is referred to W3C standards, should be always the first item to add in its source code. For example, HTML 4.01 Strict uses this declaration:

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">
```

Universal standards help to greatly reduce *market entry costs* for merchants (Laudon 2012, 53) when vendors do not need to spend much to bring their products to market. For the time being, buyers consume less effort to look for the suitable products; therefore universal standards also reduce *search costs*.

2.2.4 Richness

This feature is clear as its name, and is “defined by the user: accuracy, bandwidth, currency, customization, interactivity, relevance, security and so forth” (Evans, 2000, 23). Richness requires an e-commerce organization to transfer to any third party their information which should include six aspects: bandwidth, customization, interactivity, reliability, security, and currency.

2.2.5 Interactivity

E-commerce requires the allowance of two-way communication from their participants. Sellers should use media tools to interact with their existent customers or with their potential buyers. Considering the benefits of media tools in marketing and advertising, *interactivity* is the key tool, which is very strong in the Internet era to help e-commerce to vanquish traditional business.

To create interactivities, website designers have many choices. They can use JavaScript coding, or multimedia platforms such as Adobe Flash or Microsoft Silverlight.

2.2.6 Information Density

The e-commerce technology has been greatly lowering the information costs and in the meantime, increasing the quality of information. Information costs include time and money spending for storage, transferring, and processing. Cheaper, larger, and faster storage devices, combined with high-speed broadband communication, are the basic technological improvement that makes information become “more plentiful, less expensive, and of higher quality” (Laudon 2012, 54)

Take e-mail for example, the content inside an e-mail can be sent around the world in few seconds and this is when the traditional way to communicate like mail and voice call cannot compete with.

Another popular example is Twitter, commonly known as the SMS in the Internet world. Twitter is a social network that allows its members to post text messages, in which each includes 140 characters to the max. This limitation creates the content density in their messages and encourages people to announce not only briefly but also creatively. Twitter is widely used by business when they want to launch a new product or when their new stores are opened.

2.2.7 Personalization/Customization

To understand the personalization feature in e-commerce, we should take a look into an Amazon service called Amazon Recommendations. This largest online retailer uses an algorithm named ‘item-to-item collaborative filtering’ to analyze attributes like customers’ purchasing histories, items viewed, subject interests, or demographic data. As a result, the online store is personalized for each return or potential customer.

When a potential buyer is looking for a suitable item, he may go out and check for it directly at stores. However, it is more convenient for him to stay at home and search online based on his preferences. The store website enables functions like sorting by prices, by customer reviews, and sometimes by shipping rates in case there are many sellers for one product. All these kinds of functions could be activated in few seconds and the buyer, therefore, will make his ordering decision quickly. In addition, some sellers even allow their customers to change the contents of products with few clicks on their websites. This is the feature of e-commerce, called *customization*, and it is applied in offline business also, but is less effective and more time-consuming.

2.3 Types of e-commerce

Categorizing e-commerce is a tricky task. There are quite many approaches to characterize e-commerce business based on different view angles and the two commonly accepted ones are based on the type of goods and the nature of participants.

2.3.1 Type of goods

With this parameter, generally there are three types of goods that e-commerce business sell:

- Physical goods: cars, furniture, cookware, food, and the like
- Invisible or virtual goods: software, music, or digital images (this project)
- Services: travelling tickets, online lectures, hotel booking, and so on.

2.3.2 Nature of participants

Participants in e-commerce are mostly sellers and buyers, or in general businesses and consumers. By using this parameter, the most common types of e-commerce are B2C, B2B, and C2C (Laudon 2012, 58)

- Business-to-Consumer (B2C): this type refers to online businesses which attempt to target their consumers as individuals. This is the most common type of e-commerce nowadays with giant participants like Amazon and Wal-Mart. For this project, the author's website will act like a business and target customers are individuals who are in need of high quality digital images. Thus, his online business could be considered as a B2C one.
- Business-to-Business (B2B): even though B2C is the most common type, B2B is indeed the type with highest value of transactions – $3.3 trillion compared to $310 billion of B2C in the United States in 2011 (Laudon 2012, 58). If we consider governments as a type of businesses then Business-to-Government (B2G) e-commerce is a subset of B2B
- Consumer-to-Consumer (C2C): in this type, consumers come to an online marketplace and list their products to be bought by other consumers. The largest online marketplace that everyone is talking about C2C is eBay Corporation. In Finland, C2C famous players are huuto.net and tori.fi

2.4 Trends of e-commerce

Since this project is aiming to set up a small online business with potential customers mainly individuals, the author will focus on the future of online retail e-commerce in the United States and in European countries. Revenue trends and investment trends will be highlighted.

In the United States, retail e-commerce is predicted to grow steadily and will reach its sales at $259 billion by 2013. As shown in Figure 1, with a compound

annual growth rate in 14% from 2012-2017, the US online retail market will have revenue of $434.2 billion by 2017 (eMarketer 2013)

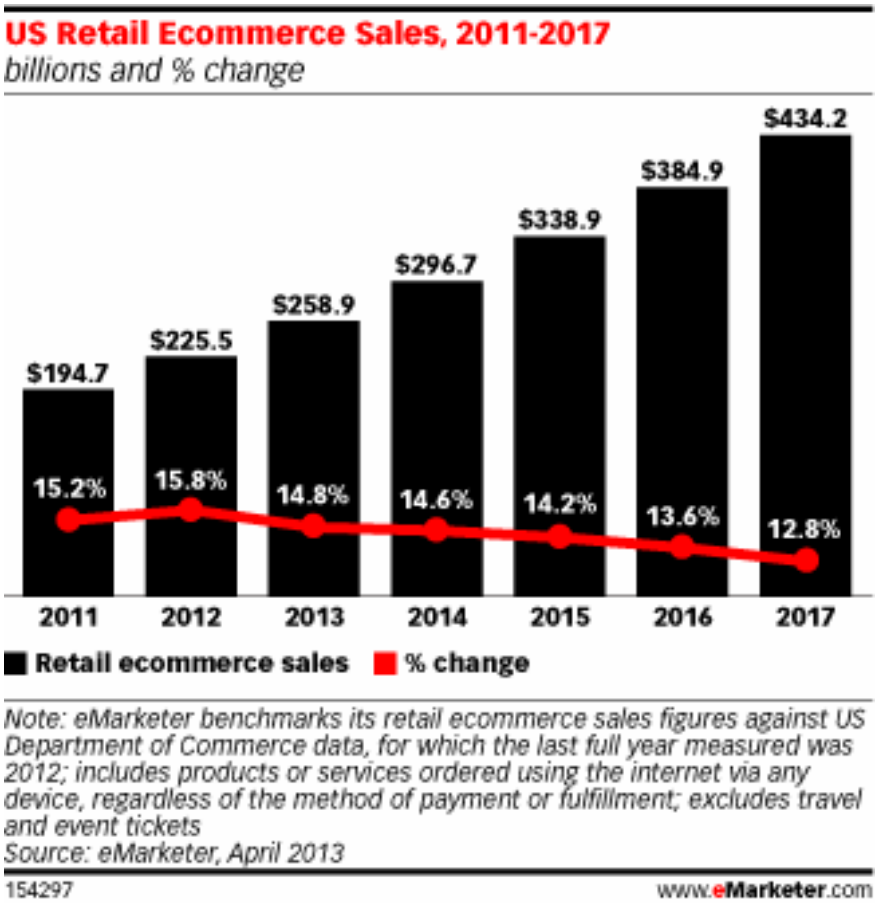

Figure 1. US retail e-commerce sales, 2011-2017 (eMarketer 2013).

Meanwhile in Europe, Figure 2, which is a part of a forecast from Forrester, shows differences in compound annual growth rates between its members from 2012 to 2017. Netherlands' rate, 9%, is the lowest one while Spain ranks first with 18% growth rate (Lomas 2013)

Within five years, United Kingdom, Germany and France are remaining top-ranked countries with predicted sales in 2017 of $64, $46, and $30 billion respectively.

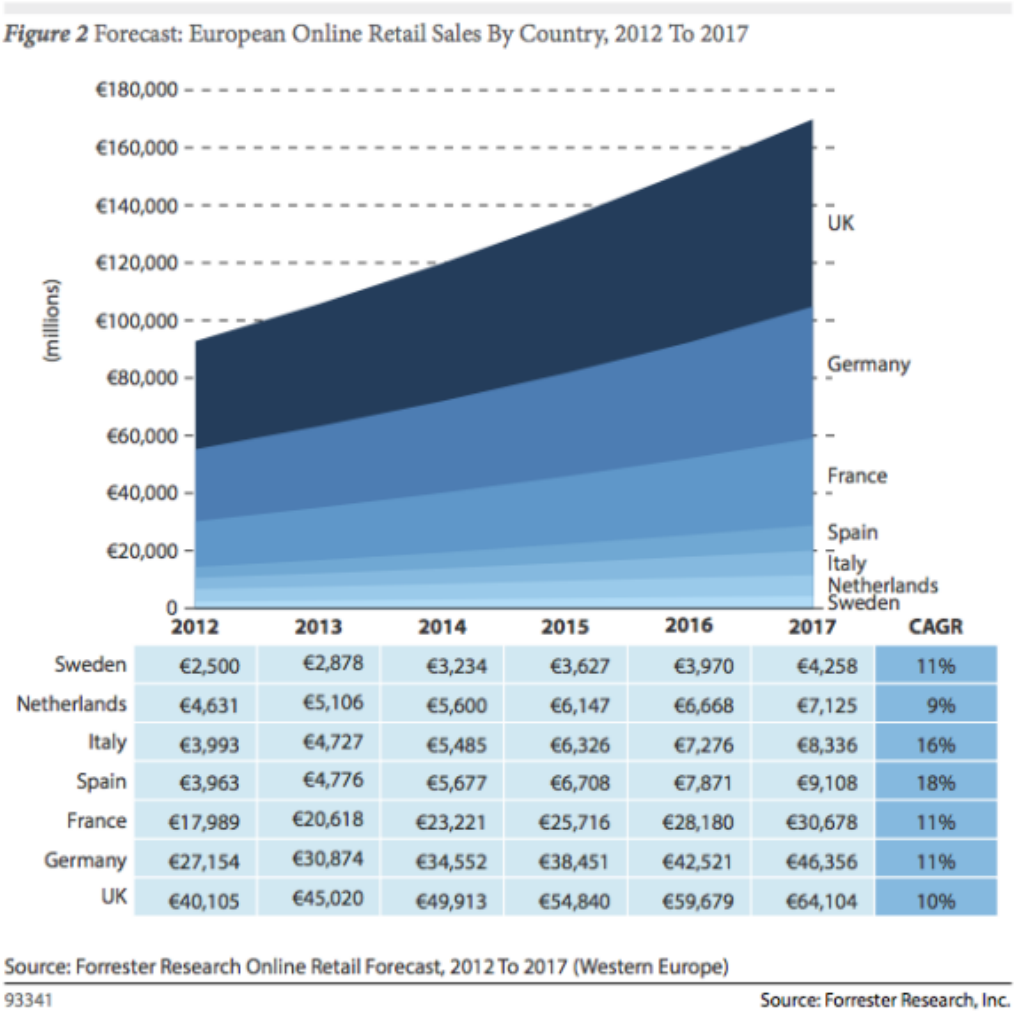

Figure 2. Forecast: European online retail sales by country, 2012-2017.

In a report by Oracle Corporation for B2C trends in 2013, nearly 200 senior executives worldwide are surveyed to determine which field online retailers should put their priorities on. The top choice by 38% of participants is investing in digital customer experience (Oracle 2013, 13) at all interaction points by enhancing personalization, a feature of e-commerce. Social and mobile commerce are also top picks to develop online business in the near future.

3 E-COMMERCE OF DIGITAL IMAGES

3.1 Definitions

Digital images are called as *stock photos* when they are licensed or traded for specific uses. Nowadays, in the Internet era, the transactions and delivery of stock photos are mostly conducted online while a small percentage is directly sale. Images can be listed on agencies' websites or on personal websites or blogs.

Contributors are professional artists or amateur photographers who list their photos or video or audio files on agencies once they meet specific requirements of both quality and content. Since professional digital cameras are becoming affordable to most photographers, the number of contributors is increasing rapidly and as a result, stock photos' prices are reduced by a large amount as well. In addition, some agencies have developed mobile applications to encourage their contributors to submit stock photos taken from mobile cameras and this trend has been creating a niche market in stock photography industry.

3.2 Business models

There are three *business models* if selling through *agencies* is the choice, and each model is characterized based on the purpose of selling:

- Macro stock or *macrostock*: known as traditional stock market. Photos are at high price and contributors are recommended to be exclusive members to gain the most benefits from agencies. The famous names in macrostock agencies are Getty Images at www.gettyimages.com, Corbis at www.corbisimages.com, and Alamy at www.alamy.com.
- Mid stock: photos are at middle price and contributors are not required to be exclusive members of agencies
- Micro stock or *microstock*: photos are mostly at micro price, which is usually under $10. Nowadays, microstock photography is the most popular business model among the stock photo market, and most

agencies combine micro and mid stock to gain more contributors. Although there are over 50 microstock sites at this moment, the top five that are chosen by hundred thousands of professional photographers are iStockphoto, Shutterstock, Fotolia, Dreamstime, and 123RF. This thesis is about to create a website that sells microstock photos, hence this model will be put on focus.

3.3 Type of licenses

When a contributor submits his images on agencies, he must decide which type of license applied to his images once they are sold to buyers. This should be totally clear since the moment he uploads photos, so the usage of his photos after buying will be legal and follow the Copyright Laws. In stock photography, there are three common types of licenses and they are widely used in all stock photography models:

3.3.1 Royalty-free (RF)

This is the most popular type in all microstock websites. *Royalty* is the fee or charge that a buyer has to pay to the seller for each time using the product. Therefore, *royalty-free* means buyers do not have to pay for images every time they are in used. These licenses cannot be given on an exclusive basis and they cannot be transferred between purchasers.

The buyers have to pay a one-time fee to use photos with their multiple purposes on a limit of reproducing times. For example, a photographer sets his license on a RF photo to allow a buyer to reproduce that photo 1000 times and the buyer has to pay only one time when he buys that photo.

Since RF photos are non-exclusive, one photographer can list the same photo under RF license onto many agencies, and sell it to many buyers. As a result, buyers do not own that photo, but they have rights to use it in brochures, on websites, or on other commercial purposes.

3.3.2 Rights-managed (RM)

While a RF license limits the time of use for each photo and is not suitable for large commercial purpose, a rights-managed license is more expandable. It allows buyers to negotiate with sellers to specify clearly the purpose of use, the duration, the territory, the size and resolution and the industry type.

RM photos are commonly exclusive and they are used by only one buyer during the license duration. Some agencies allow both exclusive and non-exclusive RM license.

3.3.3 Editorial

This type of license refers to photos that cannot be used in advertising or in other commercial purposes. Typical uses of editorial stock photos are in a newspaper or magazine article, on a blog or website for descriptive purposes, and in a non-commercial presentation (iStockphoto, 2013). Therefore, an editorial photo's content is always related to newsworthy events, if not then it should be about a public interest or at a news angle at least.

3.4 Legal releases

The content of stock photos under RF or RM licenses is very strict because of legal issues. For example, a photo submitted onto stock agencies under RF license successfully must not contain any logo, trademarks, or intellectual property. Moreover, every stock photo agency has its own specific rules and legal requirements about what type of photo can and cannot be listed for sale. However, all agencies require model release or property release when they consider that legal issues may arise from the content of a photo.

- *Model release*: this is required when faces of recognizable people appear on a photo. Even when a photo contains a part of the body of such famous people that most people can recognize him or her in the photo context, then the contributor must upload a model release. This attached

release should be signed by the contributor/photographer, the model, and by a witness.

- *Property release*: this is required when a property appears on a photo. A property could be a private home, a landmark, or any recognizable property that is protected by copyright. Similar to model release, signatures of the contributor/photographer and the witness together with an information provided by the authorized signatory for that property are required (Getty 2013).

3.5 Microstock agencies application

With the purpose of creating a microstock website for himself, the author needs to understand thoroughly all the frameworks of how and by which payment method a stock photo could be sold and what should be his website's backbone structure. To fulfil this need, he has decided to apply to be a contributor at top online agencies and was accepted at ShutterStock.com (after 2 attempts), iStockphoto.com, Alamy.com, 123RF.com, CanStockPhoto.com, and Fotolia.com. For this project, this first penetration step into the microstock industry could be considered as a success.

Within three weeks, the author had successfully submitted over 50 high-quality stock photos into those agencies and these would be used in future as his microstock portfolio, besides his website. Although these photos have not generated any sale yet, the author has gained both technical and legal knowledge about selling microstock online. Therefore, building his microstock website could be started as soon as possible.

4 WEBSITE DEVELOPMENT

4.1 E-commerce platform

Since this website is built mainly for online business purpose, an e-commerce platform should be used to enhance website and payment security and Wordpress.org is the author's choice.

Wordpress is a free and open source content-management system developed based on PHP and MySQL. For bloggers, there is Wordpress.com and for self-hosted e-commerce purpose, it is recommended to use Wordpress.org with better and more secure adjustments powered by many e-commerce plugins. From this point, all mentions about Wordpress are referred to the Wordpress.org system.

Below is the list of advantages of using Wordpress.org:

- It is an Open-source Content Management System, so it is free to use without any extra cost or any restrictions in legal issues.
- It provides user-friendly features which are easy to learn and to be tweaked and modified.
- It has a large amount of themes, both free and paid ones, to choose from and if users are not satisfied, they can create a theme for their own needs.
- It has a wonderful feature called Plugin which does not appear in Wordpress.com. Thanks to these plugins, we can extend Wordpress to do anything we would like and to look however we wish.

4.2 Domain and hosting

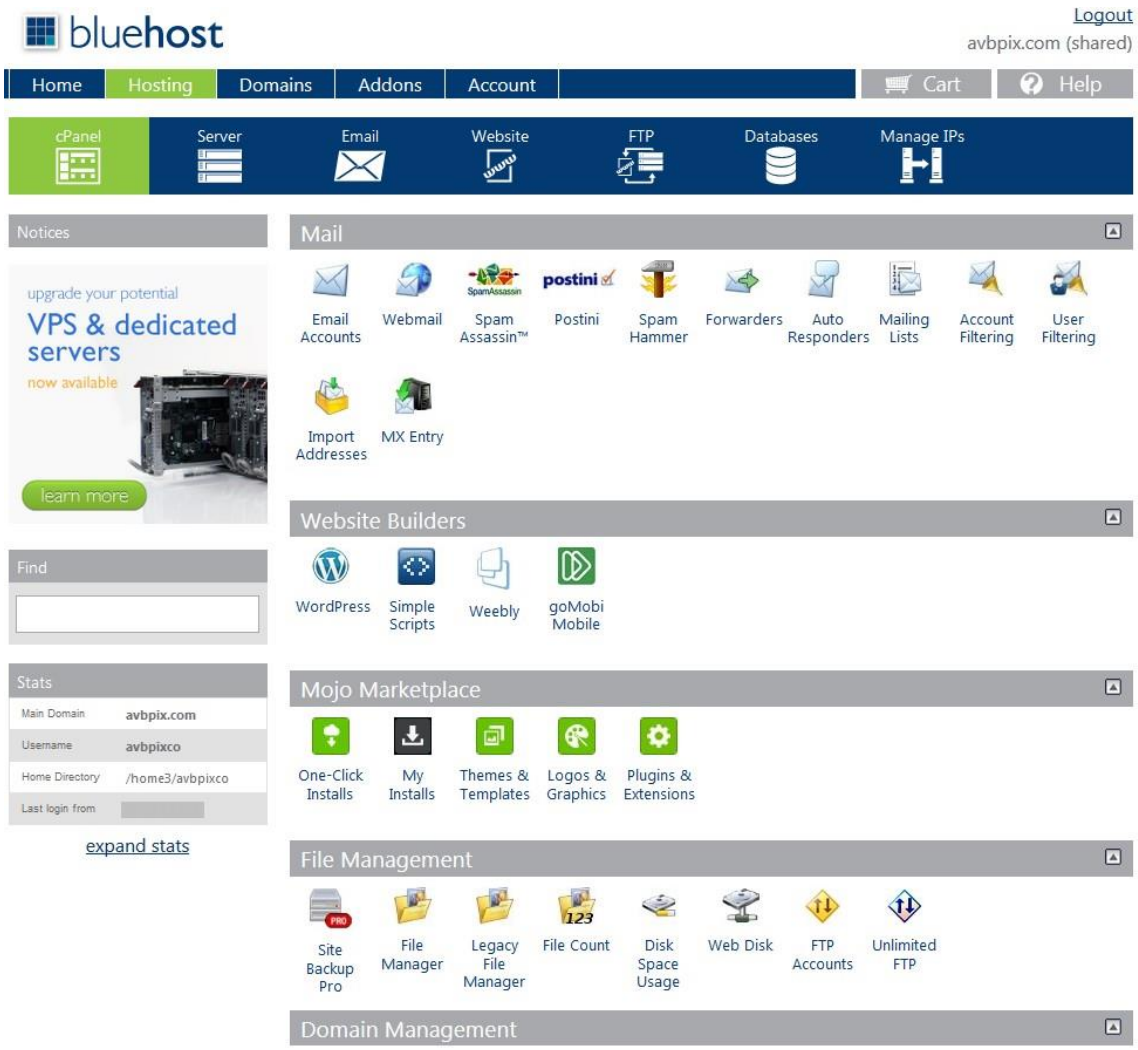

Figure 3. Control panel at Bluehost.

For domain and hosting, as recommended by Wordpress, the author decided to purchase a one-year hosting plan from Bluehost.com, which costs $5.95 per month.

The domain was included in the package from Bluehost and the website address is www.avbpix.com as AvBpix is some kind of a trademark created by the author.

After purchasing and activated, the control panel at Bluehost website was captured as seen in the Figure 3. This is the control setting centre for the host, which includes email service, database and other options for setting up a

website from scratch. These options stay in the MOJO Marketplace, where members can use One-click-Install script to install different kinds of websites, from a blog or a forum to a client or content management website, or even a social networking service.

After setting PHP 5.3.27 and MySQL 5.5.34, the author installed Wordpress 3.6.1 with the One-click-Install script on the main domain www.avbpix.com and set up administrator, contact, and info service emails for this domain.

As shown in Figure 4, Dashboard is the place to control the Wordpress website, and all settings later happen here.

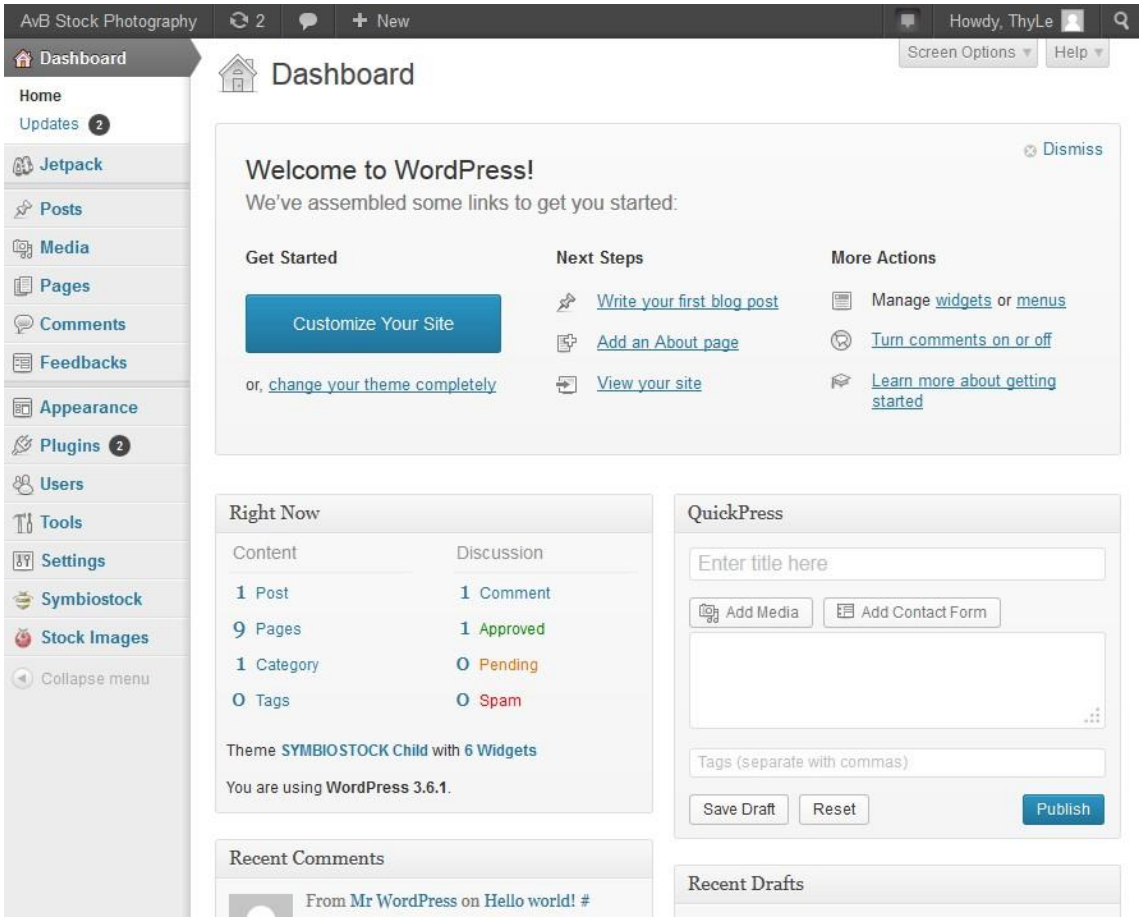

Figure 4. Wordpress Dashboard.

4.3 Theme

To sell stock photos by using Wordpress, there are many free and paid theme options to choose from and this decision has a critical effect on website appearance. As advised and recommended by several top contributors in stock industry at MicroStock Group forum, http://www.microstockgroup.com, the author decided to use the Symbiostock theme, created by Leo Blanchette from http://www.clipartillustration.com, which is free to use. This theme is designed to enhance self-hosted stock selling and has been improved by many contributors. Its purpose is to create a network named Symbiostock that connects members, who are independent stock photographers, by linking them together. Therefore, similar photos from other members' websites could be shown when a potential customer types a keyword to search and this network is a great tool to enhance search engine optimization (SEO).

Symbiostock is written mostly in PHP, together with CSS, HTML and JavaScript. The theme was written in March 2013 and has since been continuously updated for optimizing website's appearance as well as improving image transactional methods. The programming language breakdown of the theme is shown in Figure 5. (Ohloh 2013)

Language	Code Lines	Comment Lines	Comment Ratio	Blank Lines	Total Lines	Total Percentage
PHP	36,544	18,916	34.1%	7,454	62,914	56.3%
CSS	20,962	924	4.2%	2,227	24,113	21.6%
HTML	16,116	1,742	9.8%	934	18,792	16.8%
JavaScript	4,051	772	16.0%	1,176	5,999	5.4%
Totals	77,673	22,354		11,791	111,818	

Figure 5. Symbiostock language breakdown.

The latest version of Symbiostock on 26th October 2013 was 2.9.4 which was installed together with its child theme Dragonfly. A *child theme* is a Wordpress theme that inherits all the functionalities, features and codes from its parent theme while making no changes to the parent theme (WPBeginner 2013). In the world of Wordpress, it is highly recommended to use a child theme to customize

the style and features of its parent theme so that when creating wrong codes happens, it is quite easy to back up by re-installing the child theme only.

For online payment, Symbiostock integrates a Paypal plugin so all payments are conducted in a Paypal gateway. This is safe for both buyers and sellers since payment is secured by Paypal Seller and Buyer Protection programs.

4.4 Image Protection

Once initial settings for the website are finished, it is the time to understand methods for protecting images as online products before publishing them. Protection here refers to preventing images to be downloaded illegally or to be used in an unauthorized manner by image thieves, and actually this is totally impossible with high-tech thieves. Therefore, the only protection approach is to discourage thieves by making stealing more difficult and complex and this approach can be achieved by using several methods. Some methods, such as using low resolution images, breaking images into smaller image tiles, or placing a transparent foreground image onto an image, are not suitable for this e-commerce project since they certainly reduce the attractiveness and competitiveness of products. There are three methods researched in this project and they are explained below.

4.4.1 Terms of Use

The simplest method is creating a “Terms of Use” or a policy page, which should define who the author (copyright holder) is, which right the owner has with his or her images, what type of licenses applied to images, and under which international or local legal documents. The author of this thesis has managed to process his End-user License Agreement (EULA) and embedded its link in every image page. This EULA is written and contributed by many professional photographers from Symbiostock forum and it is modified, by the author, to be enforceable by the European Laws. This important document is put on the navigation bar and can also be accessed by this link:

http://www.avbpix.com/end-user-license-agreement/

The EULA indicates clearly which use of image is allowed and which use is prohibited. Every time a buyer would like to checkout, a link to EULA page will appear and he or she must tick “Agree to terms above” to express his or her understanding and accepting of the terms of the EULA to finish the payment. An example is shown in Figure 6 when a buyer wants to buy an image at “Small” size, 720 x 480 pixels at €5.00

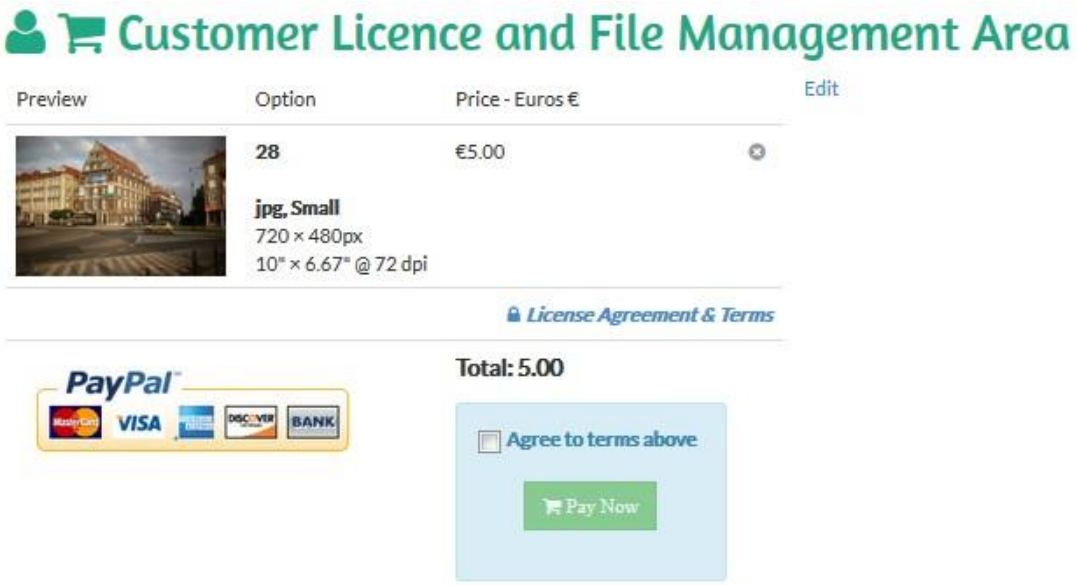

Figure 6. Agree to EULA before payment.

4.4.2 Right-click disabling

Using a simple Javascript code to disable right-click is a method to discourage people who have little knowledge about information technology. There are many approaches in Javascript and they are used quite popular for years. Below is an example script which will display a text “Right Click Disabled” when someone tries right-clicking on content.

```
<script language="javascript">
document.onmousedown=disableclick;
status="Right Click Disabled";
Function disableclick(event)
{
  if(event.button==2)
   {
     alert(status);
     return false;
   }
}
</script>
```

This method used to be popular among small websites but it is no longer effective since most Internet browsers nowadays have options to disallow disabling right-clicking or simply to turn off Javascript. Besides this method usually causes annoyance to potential customers since they feel insecure to browse the websites or they consider that the websites use low-end methods in security. Therefore, the author decided to drop this Javascript option out and to keep clicking experiences as in default settings.

4.4.3 Watermark

In the digital world, a watermark is a visible image embedded or imprinted digitally onto a main image. That watermark image could be a logo, a name, a copyright symbol, or any other text or shapes (O'Briant 2010). Using a watermark is the most common and strongest image protection technique nowadays since removing it usually takes a lot of time and is not easy for amateurs, especially when the watermark has different blending color modes.

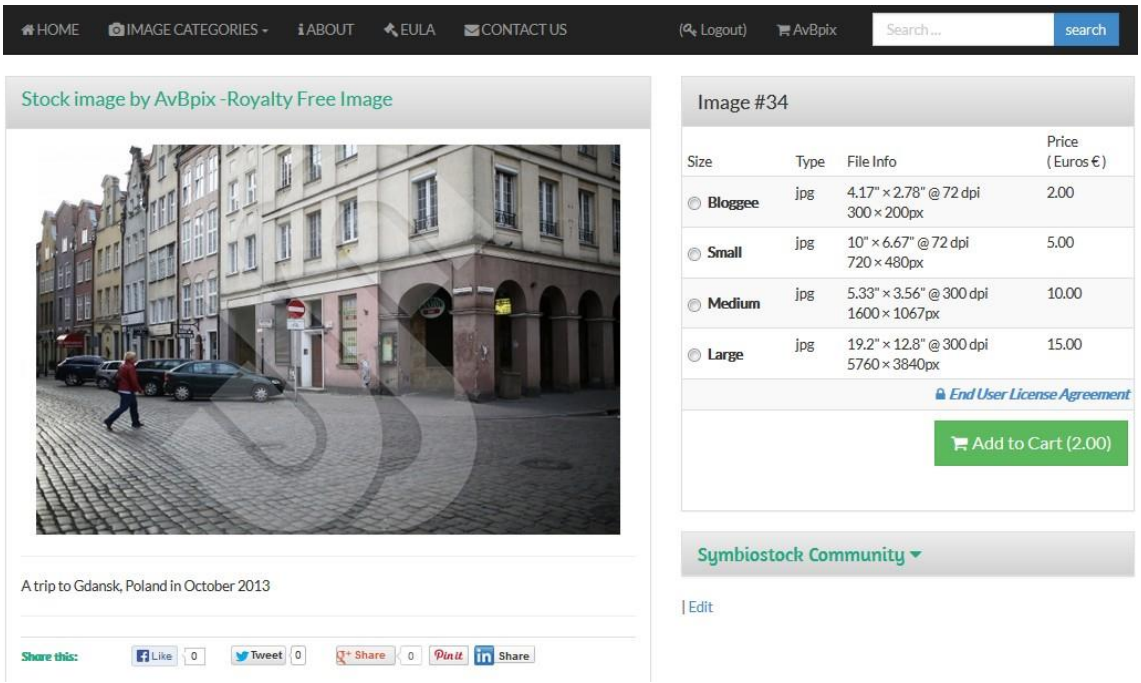

Figure 7. Symbiostock watermark in use.

Adding watermarks depends on the purpose of using images: commercial or non-commercial. For examples, an image shared on social networks does not

need to have a large size watermark on it or even no watermark at all. However, when it is put on sale for reproducing purposes, such as advertising or illustrating, then a watermark should be embedded in a proper way since it is a part of the branding strategy as well. A proper watermark should be a balance of image protecting capability and viewing experience. To achieve that, it should be a complex graphic and contain different subtle effects in several layer blending modes. It should coverage maximum 30% of the total image space and should not be distracting to viewers. Figure 7 above shows an image on sale with a watermark embedded as a logo of Symbiostock project (designed by Leo Blanchette).

4.5 Image Submission

In general, a finished image must go through three steps before being ready for sale on the website. They are Uploading, Processing, and Publishing as shown in Figure 8.

Figure 8. Three steps to submit images.

4.5.1 Uploading

There are two options to upload images in Symbiostock: using directly built-in flash uploader, or using a File Transfer Protocol (FTP) client such as FileZilla. The second option is recommended if there are many images to upload at the same time since the FTP uploading speed is much higher than direct method. In Figure 9, the author uses the flash uploader to upload three JPEG files of which the average file size is about 5 MB and resolution are 5760 x 3840 pixels identically.

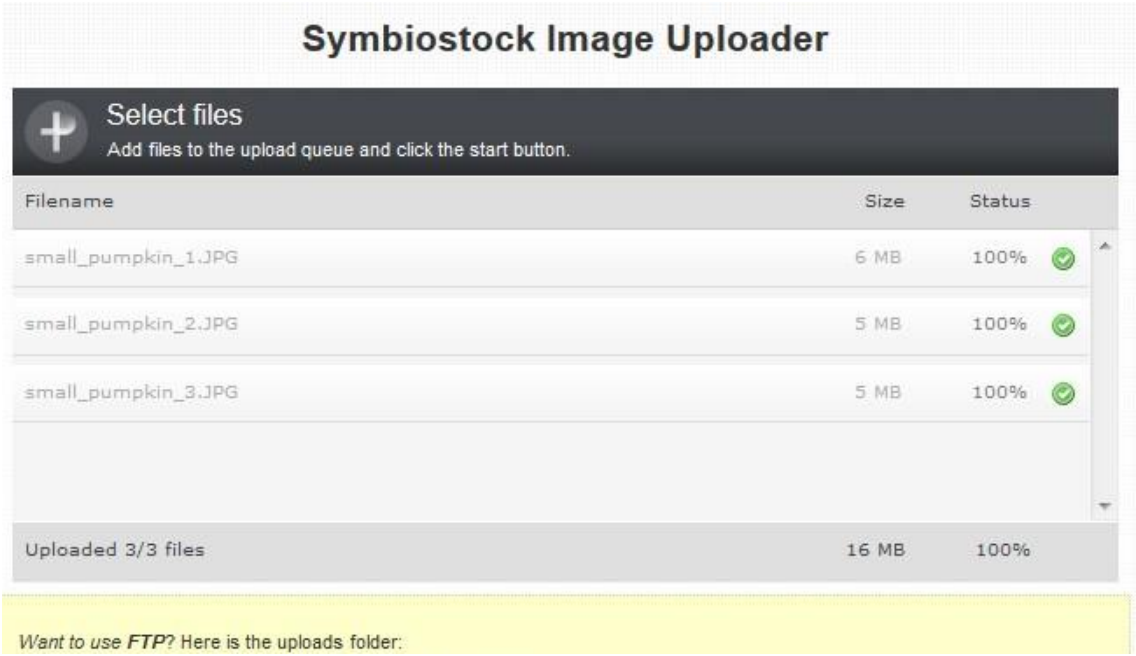

Figure 9. Built-in flash uploader.

4.5.2 Processing

After uploaded, these images will be moved to Process tab. In this tab, Symbiostock tries to read the IPTC data of each image. IPTC, a metadata standard developed by the International Press Telecommunications Council, allows photographers to embed descriptive information into a digital image. This information could be title, caption, description, keywords, copyright information, or location captured. IPTC is different from EXIF; even both of them are metadata formats. EXIF, stands for Exchangeable Image File Format, is embedded into an image at the same time it is captured by a camera. Therefore, EXIF data contains camera-related information, such as file name, size, resolution, camera model, lens, focal length, aperture, metering mode, exposing mode and so on.

In Figure 10, Symbiostock cannot find the IPTC data of the uploaded images and warns the seller about updating three important data fields of a microstock image: title, description, and keywords. These fields will be used to help potential buyers finding the images they need quickly and easily in the Search function.

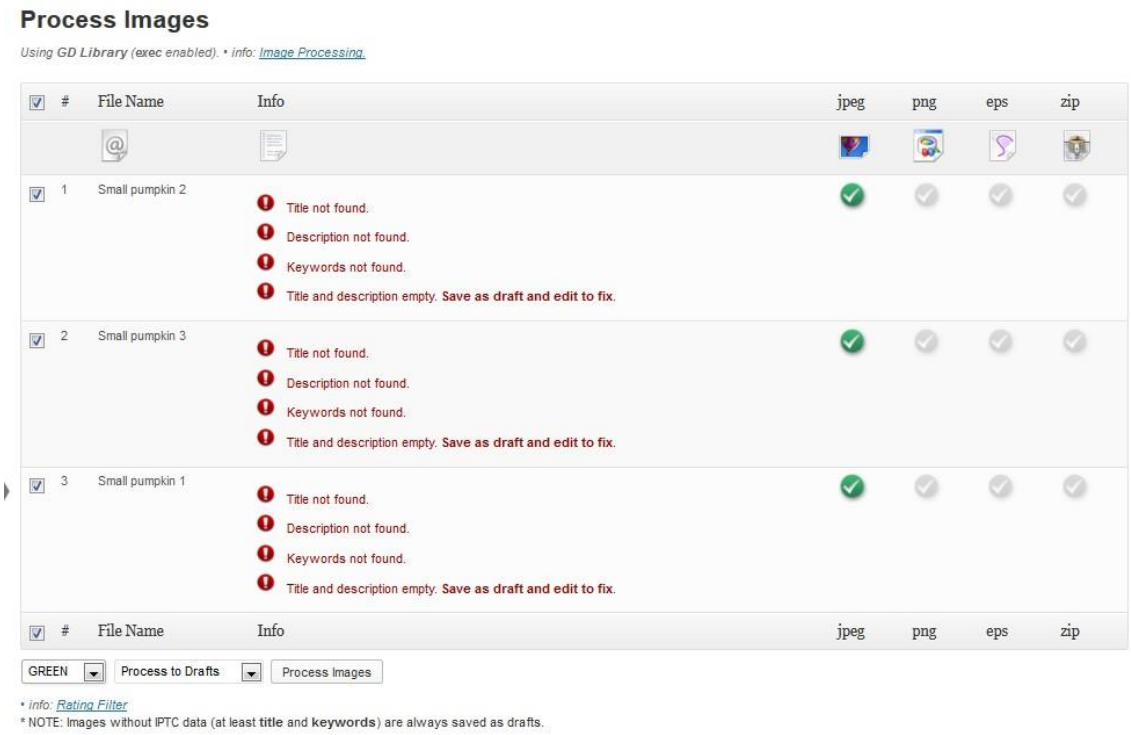

Figure 10. Warnings about IPTC data of images.

The Process tab also indicates which formats of images have been uploaded; in this case they are all in JPG formats. Besides, Symbiostock has three options for Image Rating level: Green, Yellow, and Red, which will help the site owner to filter image's content from the network search results. These ratings are explained in the Symbiostock's guide as in Figure 11.

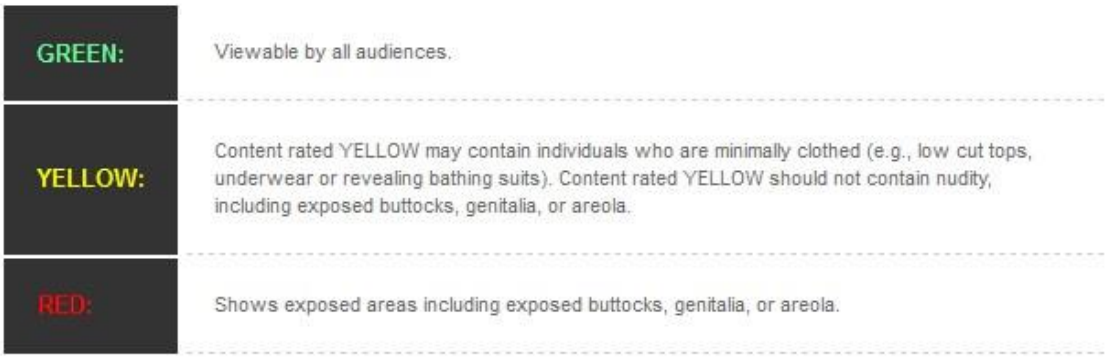

Figure 11. Image Rating levels of Symbiostock.

Since this project website contains no nudity images, the default rating is set to Green for all images. The next step is to edit images and the author can apply bulk (or batch) editing because these three images have similar content. In the

bulk editing mode, the author set the same image categories and keywords for these images as shown in Figure 12.

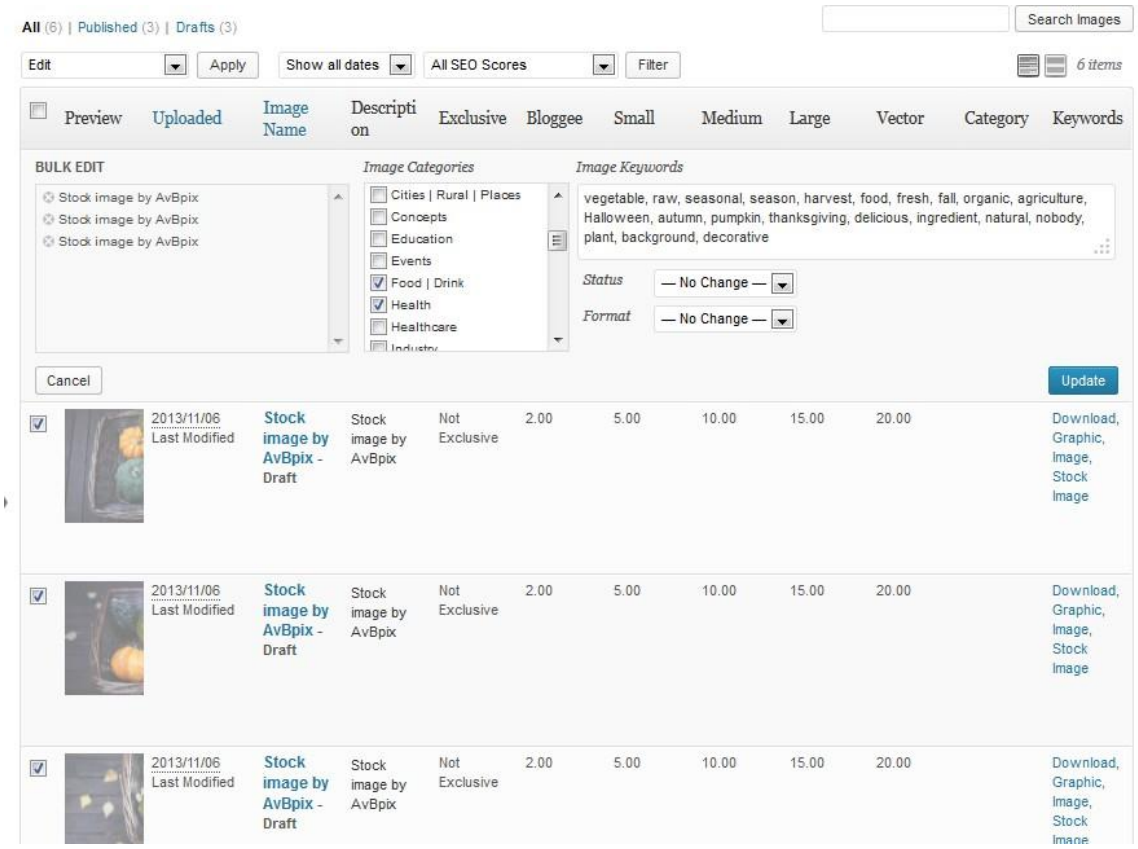

Figure 12. Bulk editing for similar images.

Keywords are very important to stock images. These words should be simple but descriptive enough about the content. Usually microstock agencies limit the amount of keywords in an image to 50 words to avoid spamming. In Figure 9, the author adds 21 keywords for these images of small pumpkins inside a basket on a wooden surface. When the author feels that these keywords are not descriptive enough or relevant, he can remove them or add more lately. After putting keywords, the author inserts a title or a description to each image and then it is ready for publishing.

4.5.3 Publishing

When an image is ready technically, then it should be completed with commerce-related issues. This publishing step is focusing in two issues: price and legal release.

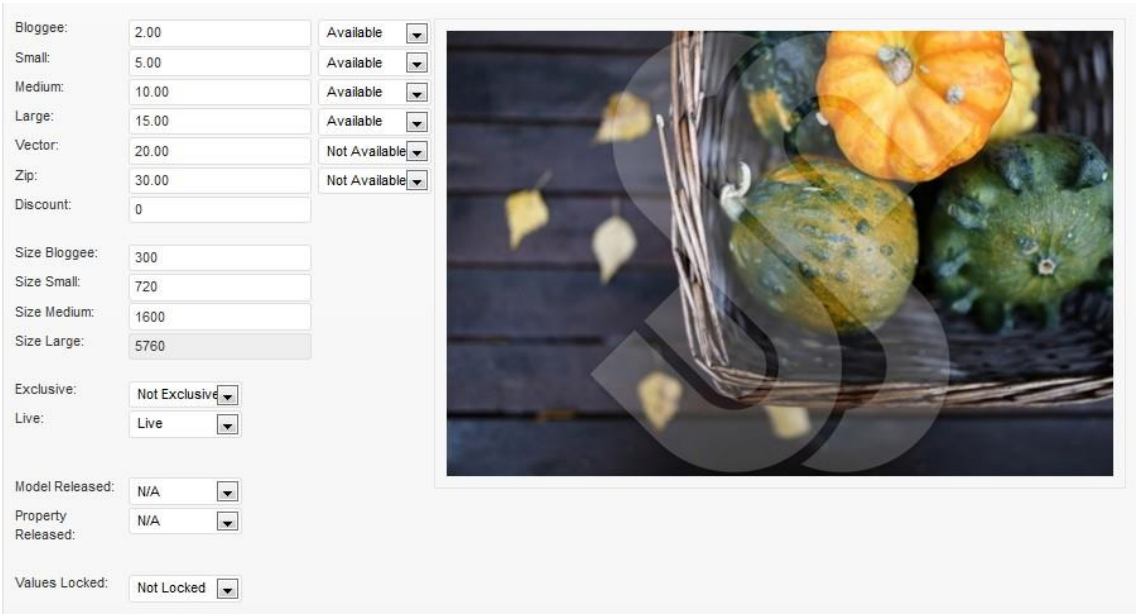

Figure 13. Prices and releases on the Publishing page.

Depending on file size to be downloaded, an image will have different prices. Symbiostock allows the author to set up prices in USD or EUR for four types of sizes and two types of file formats as seen in Figure 13. The author can adjust the resolution for each size type and when a buyer pays for a specific size, the image will be resized properly and appear on Customer File and Management Area for downloading.

Below the pricing area is where the author can attach proper legal release for an image if that is a must. For example, a model release is required when there is a recognizable people's face in the image. If one model appears in many images then only one model release is required for those images. Many stock agencies allow their contributors to use the same model release files from other agencies since these releases have the same contents. In this Symbiostock project, the author uses legal release samples downloaded from the

Shutterstock website since they are widely accepted by other agencies and media organizations.

When pricing and release checking are finished, it is the time to publish images so potential buyers can search for them in Web Search Engines and inside the AvBpix website. The author then uses a widget to show similar images to widen a buyers' selection for same subjects. This widget can be embedded in the sidebar of the image page as shown in Figure 14 or below the image panel. At this point, image submission is considered completed and the project mission as website building is theoretically accomplished.

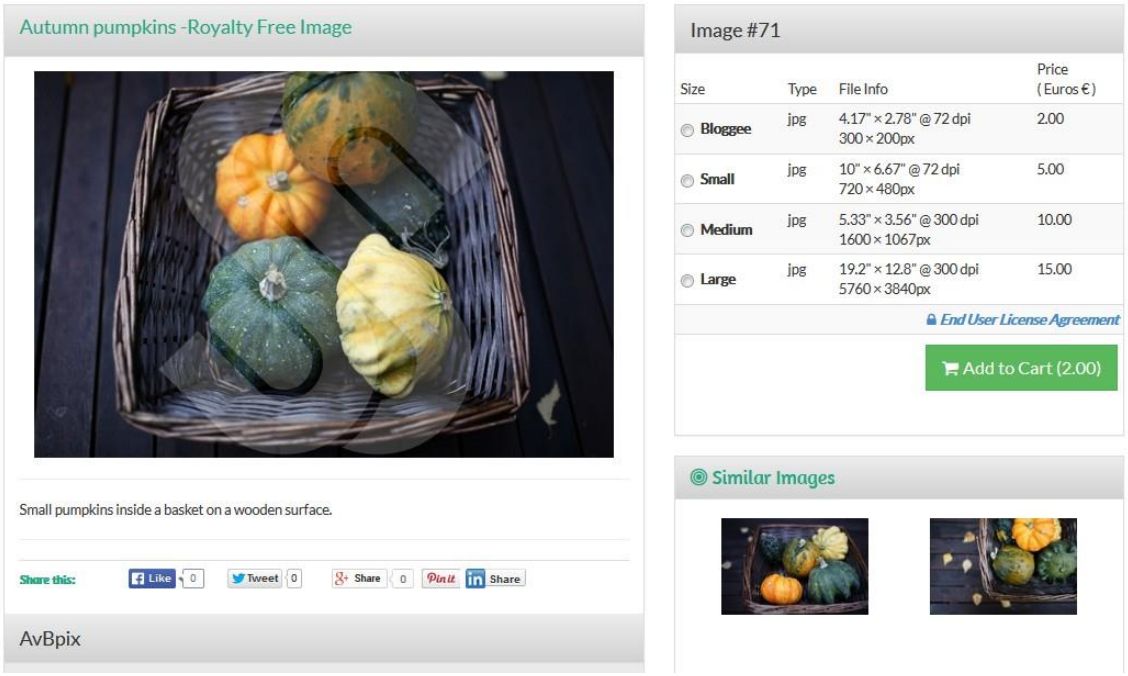

Figure 14. Similar image widget in use.

4.6 Website load test

After building the website, the author would like to test its loading performance in three popular web browsers: Internet Explorer (IE), Firefox, and Chrome. This is done by a website test tool from an open source project called WebPagetest, which is developed and supported by Google. The tool can be accessed at www.webpagetest.org and it allows testing to be done in various locations around the world in different web browsers.

The author selected five locations in different continents to conduct the test and build a graph to compare results. In each location, each browser test was repeated three times and the average full load time (in seconds) was noted for comparison.

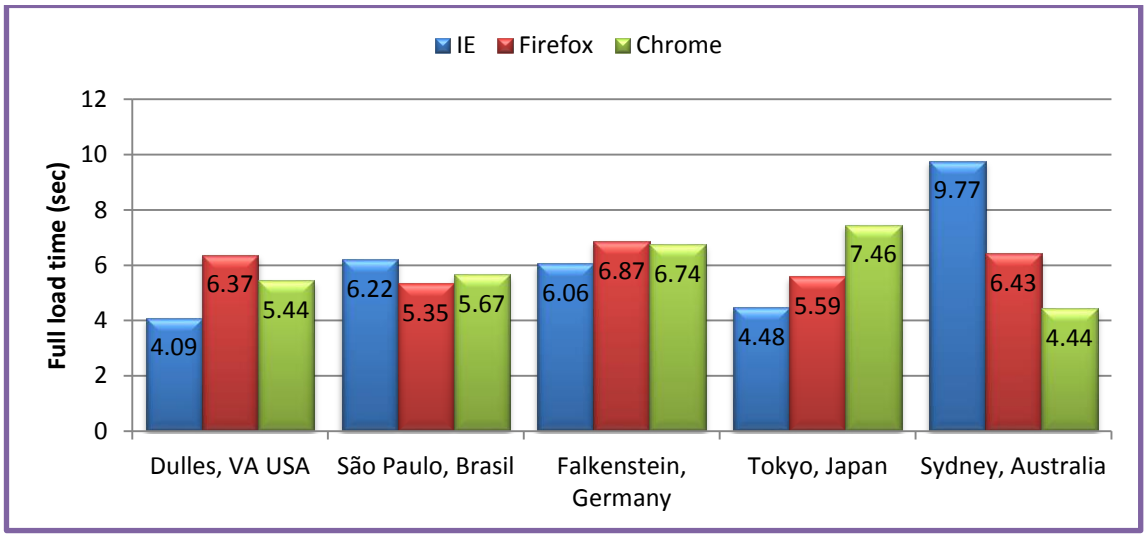

Figure 15. Full load test in different web browsers.

From the graph illustrated in Figure 15, the AvBpix website is fully loaded after about five to six seconds in all three browsers, except the 9.77 sec with Internet Explorer in Sydney. This unusual result may happen due to testing server overload or because of some unknown browser incompatibility issues. Nevertheless, the loading time could be considered as normal and acceptable since the website has many high resolution and heavy images and thus it is launched after this test.

5 CONCLUSION

While working with the Symbiostock theme, the author has contributed his ideas to improve its selling capability for sellers as well as to polish browsing experiences for buyers. His contribution might not be as much as other members' great ideas but it shows that he will try his best to stick with the theme project and its developing community as long as he could.

The e-commerce website www.AvBpix.com was born as a combination of photography as hobby and web technology study. This online image store was not such a thesis project's product; it has been and will be a working place for the author after he finishes studying at Turku University of Applied Sciences.

During three months, this project has helped the author improve both business and programming skills greatly and it makes him feel like an entrepreneur joining into the attractive but competitive e-commerce world. There are still several technical issues to be improved and several business skills to be gained until the website is recognized by potential buyers. Some of these challenges, which will be mentioned in the Further Development chapter, could be overcome easily in short time but others could be long-time and hard-working projects. As usual, a business always has to struggle to thrive and that path is definitely not straight and easy for the author but walking on it is a lifetime experience on self-improvement.

6 FURTHER DEVELOPMENT

Since this website is a newborn, there are many incoming challenges after it is launched. These challenges relate to technical problems as well as to business aspects and will be described in their descended priorities.

Branding designing is the main concern and the top priority issue. The author has to design website logos by himself or by hiring a graphic designer once the selling is considered as profitable. These logos include the main header logo, the square site logo, the site avatar, and the login page logo. The website interface will be modified not only to have a simple and friendly look but also to offer buyers a professional business atmosphere. The watermark is an important part of branding designs, too. Currently, the AvBpix website is using the default watermark from Symbiostock theme, which has very good subtle design already, but in the long run, a unique watermark is a must without a doubt and will be designed as soon as the new logos are ready.

The stock industry requires fresh images everyday with various creative contents, and this pushes the author to update new images as frequently as possible. After one year, the amount of high-quality stock images could easily reach over 1000, which is equivalent to approximate 5GB storage. Since this storage is vital, a *backup plan* is required definitely and it should use both Wordpress backup plugin and manual backup.

In order to advertise the AvBpix website, the author should create a detailed *internet marketing strategy plan* and put priorities to its goals. The first goal should be *Search Engine Optimization* techniques (SEO), which will help increasing website traffic and visibility in search engines like Google, Yahoo! and Bing. These techniques include link, content, image and template optimization, website rank improvement, and XML and HTML sitemap optimization. The second goal will be *social media marketing*, which gains attention through social networking sites such as Twitter, Facebook, and Google+. Since these sites are embedded inside the Sharing panel in the Image page, potential buyers could share or put comment on images easily with

few clicks. Therefore, social networks' accounts should be monitored and kept active. As a part of social media marketing, a *blog* should be created on the sub-domain and be updated frequently with interesting contents about general photography, stock image highlights, website's progress, or reviews about camera's equipment. The content of blogs should have some direct links to social networking sites and vice versa. The third goal in internet marketing strategy concentrates on boosting mobile experiences for both potential and registered buyers by building a simple mobile version of the AvBpix website. This version will include an image search page and file management page, with less focus on payment because payment should be conducted on the desktop version with more protection and convenience.

Another challenge stays in *payment integration*. At the beginning time, the AvBpix website allows customers to pay with Paypal through its gateway only. In some countries, where Paypal is not popular or not allowed, customers demand other payment methods, such as Google Checkout, Authorize.Net, or even bank wire transfers. The author needs to consider integrating these methods to provide buyers their best and the most convenient payment selection.

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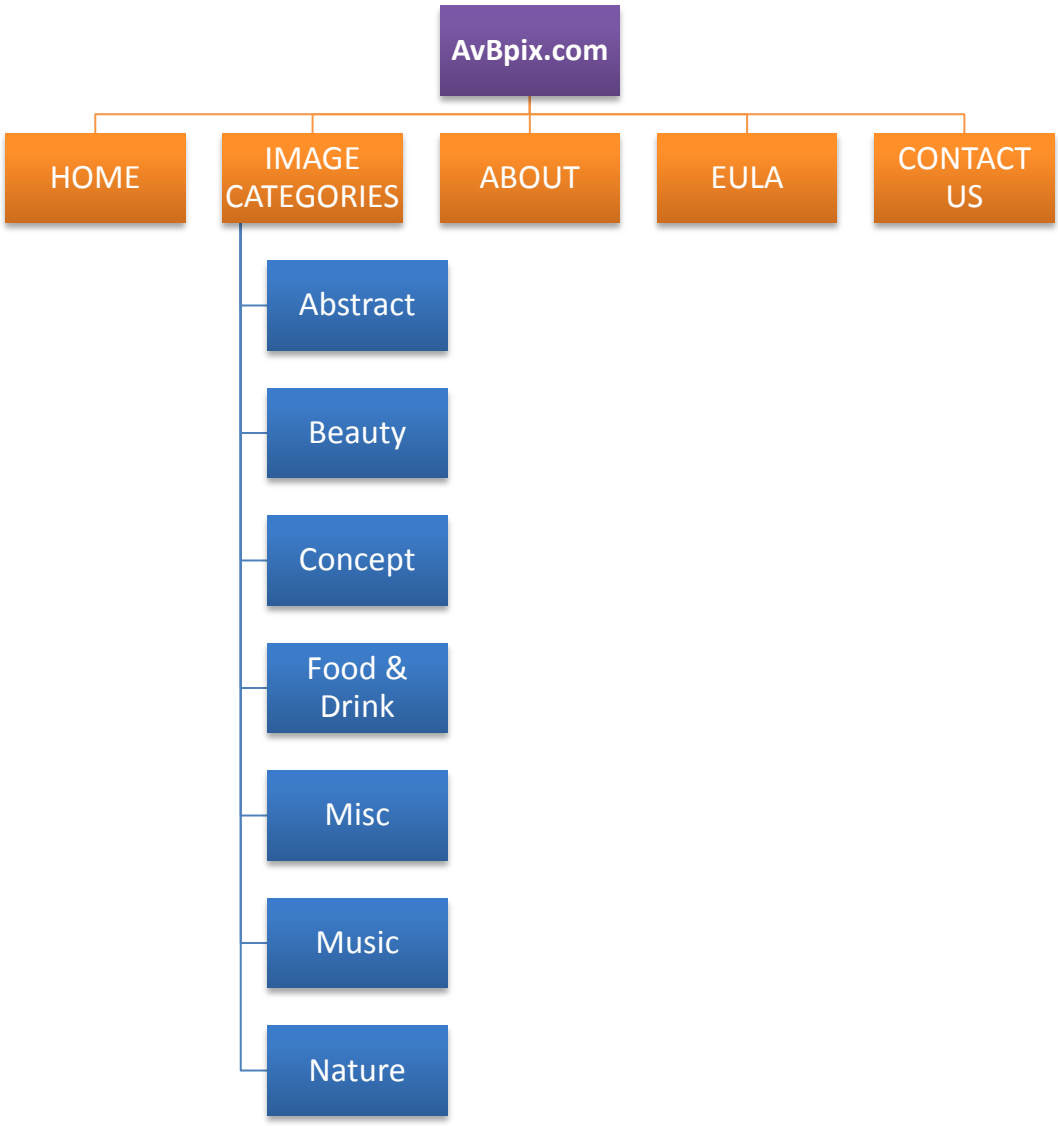
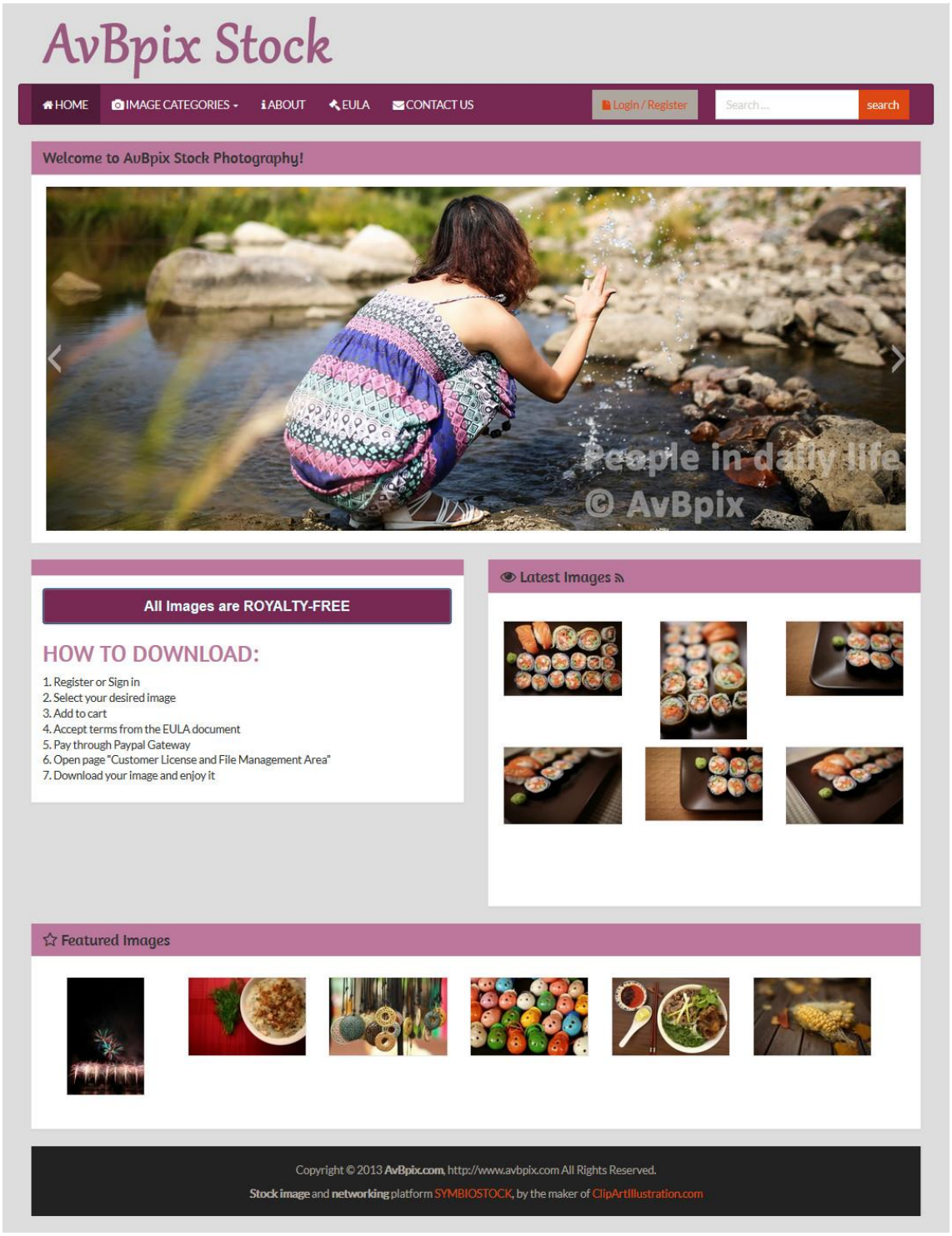
APPENDICES

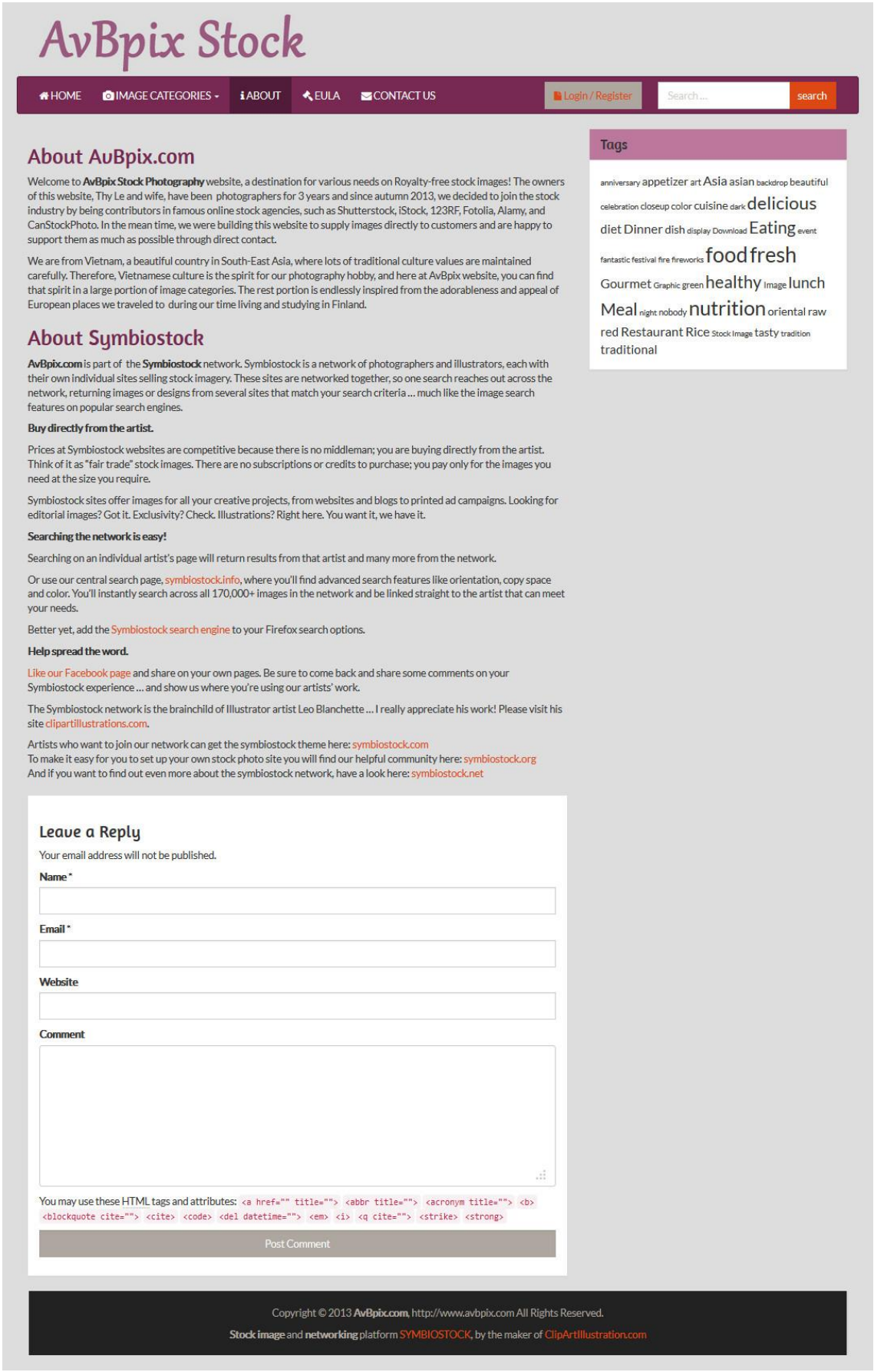
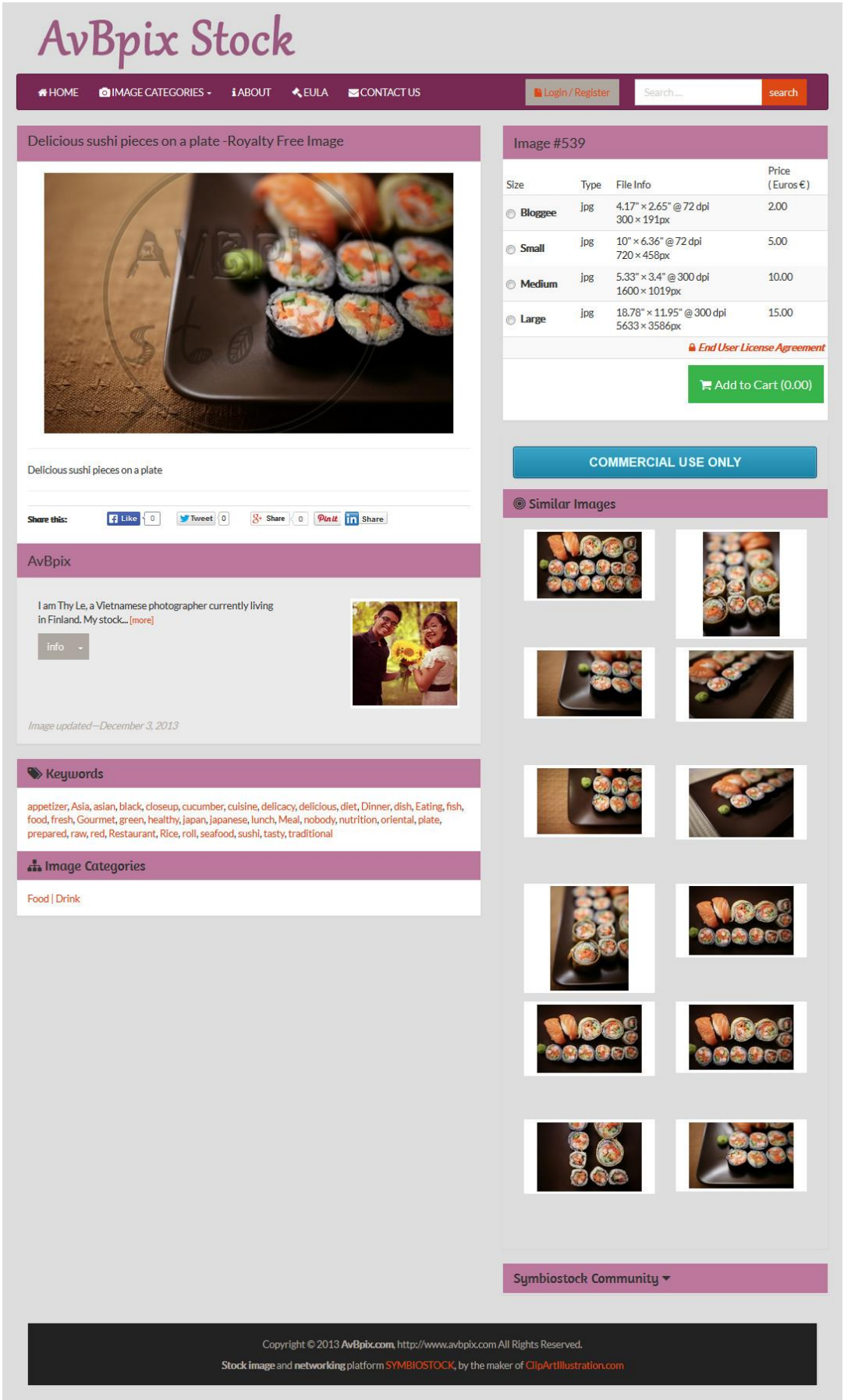
Appendix 1. The site map of website www.AvBpix.com



Appendix 2. ‘Homepage’ screenshot



Appendix 3. ‘About’ page screenshot



Appendix 4. 'Stock Image' page screenshot