Creating Pixel Luxury:
Research and Design of a High Quality Resource Website

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Kendall Dea

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Abstract

The purpose of this study was ultimately to create a website featuring useful resources for designers and creative individuals. This paper examines past studies dealing with user interface and design fundamentals of web design, and then applies their results when planning the basic layout of the final website. The website was then coded and uploaded online with the name, Pixel Luxury. After finishing and uploading the first version of the website, some of the primary challenges that arose during the creation process were documented, as well as many of the useful tools that aided the overall design and coding process. The study concludes by outlining several areas for possible future study and continued growth of the website. The results of this study can be beneficial to future students and designers looking for introductory guidance into the web design process.

Chapter 1

Purpose of the Study

Background of the Problem

The Internet has become an integral part of the modern world we live in, and is debatably one of the most revolutionary inventions in the history of humankind. Never in history has so much information been made freely available for anyone to access. Unfortunately, the ease with which anyone anywhere can publish information online has created an information overload and clutter that can be daunting to sort through in order to obtain the knowledge we seek.

This study focuses on alleviating this problem for students studying Graphic Communication (GrC) at Cal Poly, especially those concentrating in design related disciplines. GrC students have a vast number of guides, resources, and tools available to them that range from free font libraries to entire websites filled with tutorials on coding with HTML and CSS. However, with so much information available through a number of outlets, students can easily spend much of their time just finding the tools they need instead of spending that time actually working on their projects. The process of finding information and resources needed to be streamlined to minimize time spent browsing through volumes of information, refocusing it towards producing higher quality work. The research presented in this study was used to help understand the best way to design a website which presented information that was useful and relevant to current GrC students.

Interest in the Study

Throughout my four years studying Graphic Communication at Cal Poly, I found that on numerous occasions there existed a vast number of free resources that would have

aided me in several of my design projects. However, there existed a reoccurring problem; I never knew where to find these resources or was unaware of their existence until it was too late for them to aid me.

My solution to this problem was to create a user friendly website where users can go to find the information they are looking for. The GrC resource website was designed to serve as a one-stop place for GrC students to go to get the information they need while exhausting minimal time and effort. Additionally, the website was also created to be a collection and storehouse for many of the resources that I had discovered throughout my years here at Cal Poly. Having a place to reference this information, as well as share it with others, is something that makes my life easier, and allows me to give back to the community that helped shape me into the designer that I am today. Lastly, this website serves as a gateway to a world of other possibilities in resources management and information accessibility.

Chapter 2

Literature Review

2.1 Focus of Research

While the design process is often regarded as being highly subjective, there have been a large number of empirical studies conducted to determine some key considerations that appear to make certain designs succeed over others. The primary focus of this literature review was to gather a portion of this empirical data so that it could then be used as a foundation upon which the GrC resource site would be built. The study results covered in this literature review do not represent a universal formula for success in web design. Rather, the research results presented are design suggestions that are backed by statistical evidence. The information gathered has been organized into two main aspects: cognitive mapping, and website aesthetics.

2.2 Cognitive Mapping

In order to understand why certain websites might be favorable over others, it is important to first understand a little about how the human mind works when it is presented with a new website to make sense of. Cognition is what allows human brains to interpret the world we are presented with, make sense of it, and formulate conclusions about what to do with this new information (Russell 2003). This is all taking place in a matter of moments as we come into contact with something we are unfamiliar with. Cognitive psychology studies this concept and uses it to explain how humans react to certain situations and new information.

Research presented in a study by Purinton and Rosen (2004) proposes that one method for understanding effective website design is to study the science of cognitive psychology (Purinton & Rosen, 2004). The authors build upon the research conducted by Rachel and Steve Kaplan (1973, 1982), and use cognitive psychology to empirically determine what drives users to like the design of a website and want to use it repetitively. Humans all have cognitive maps that are the product of their past experiences. When humans are presented with a new situation and information, they naturally draw upon these mental maps in order to make sense of the new data (Kaplan, 1973).

In Purinton and Rosen's (2004) study they explain:

> For example, having traveled on subways in New York or Boston, an individual traveling to Washington, DC for the first time would be able to draw on his/her cognitive map of a subway system and be able to anticipate how he/she would navigate from Points A to B. (p. 789)

Purinton and Rosen then elaborated on this concept and apply it to a user's navigation of a website. Through a survey of 211 undergraduate students, Purinton and Rosen were able to determine three considerations that largely comprised the cognitive maps their participants used when judging several retail websites. These three considerations were: coherence, complexity, and legibility. Coherence refers to the ways in which various elements on the website are able to work in harmony with one another, and is often achieved through the repeated used of certain elements and textures. Complexity refers to the main contents of the site and favors a richness of text and graphics that is both clear and informative. Lastly legibility refers to elements of the site that make it easy to remember and facilitate wayfinding as a user navigates through a site. Wayfinding is

defined as the ability for a user to find a way to a particular location in an expedient

manner and to recognize the destination when reached (Peponis, Zimring, & Choi, 1990).

High legibility is often achieved in web design using reoccurring logos and landmarks, as

well as a navigation system that is easy to use and remains consistent throughout all pages

on the site. When creating the GrC resource site it was vital to keep these three aspects in

mind to ensure a higher level of user satisfaction and experience. Applying the concepts

expressed by Purinton and Rosen helped to form a strong design foundation upon which

the other elements of the resource site could be built.

2.3 Website Aesthetics

Although design aesthetics are largely a subjective matter, my research was able to

develop around several studies that expressed useful guidelines and practices to keep in

mind when creating a website.

2.3.1. Why Aesthetics Matter

According to Donald Norman (2004), "Usability is no longer the ultimate goal for

designers. New systems must also have an aesthetic value and inject a little fun and

pleasure into people's lives" (Norman, 2004).

In a study entitled, "How will the use of graphics affect visual aesthetics? A user-

centered approach for web page design", researchers Yang-Cheng Lin, Chung-Hsing Yeh,

and Chun-Chun Wei expressed that design aesthetics are a user's first impression of a

website and that this can have a strong impact on their over perceived experience of the

site (Lin, Yeh, & Wei, 2013). This means that it is vital to ensure that there is nothing to off

put a user within the first few seconds they looking over a site. It is usually within these

first few seconds that the user is determining whether they want to continue exploring the

site or continue browsing with options (Lindgaard, Fernandes, Dudek, & Brownet, 2006).

2.3.2. Color Theory

According to Nathalie Bonnardel, Annie Piolat, and Ludovic Le Bigot (2011), color

choice is a huge consideration contributing to a user's first impression of the website.

Through their research they were able to determine that of all the major colors of the color

spectrum, the two that received the most positive feedback when used in website design

were blue and orange. In particular they found that users initially preferred the feeling they

got from a blue background to that of any other color. However, a further investigation

revealed that an orange background on a website actually seemed to enhance a user's

ability to remember information they had scene on the page (Bonnardel, Piolat, & Le Bigot,

2011). Based on their findings, a color scheme based on the colors blue and orange was

developed for the GrC resource site.

2.3.3. Ratio of Graphics to Text

Further analysis of Lin, Yeh, and Wei's study revealed that an optimal ratio of

graphics to text in a website's overall visual layout was 3:1 or 1:1 (Lin, Yeh, & Wei, 2013).

Their findings showed that websites that exhibited elements in these ratios were perceived

as being easier to use and more clear to follow. Because of this, a ratio of 3:1 graphics to

text was used on the GrC resource site.

2.3.4. Simplicity

Purinton and Rosen's previously mentioned work on cognitive psychology was also revealing of a desire for simplicity of a websites elements.

A quote from their research regarding this was:

> They (their test subjects) preferred simple subject headings, which describe broad categories rather than lengthy lists or paragraphs of descriptions. They did not like sites, which made them feel that they had to search extensively, hence, a preference for an absence of mystery. (p. 792)

Additionally, Gek Woo Tan and Kwok Kee Wei found in their empirical study of web browsing behavior that the famous saying, "a picture is worth a thousand words," actually represents some degree of truth in web design. Their study found that replacing a text heading with a graphic icon was almost always preferred, and was usually better understood (Tan & Wei, 2006).

Both of these concepts were highly utilized when refining the contents of the GrC resource site. Graphics were added to supplement all major headings or in some cases replaced the heading entirely. Headings that remained text were then modified to represent bigger categories to break apart some of the larger lists of resources.

Chapter 3

Research Method

3.1 Tools Used

In order to be able to design and code the website, several important tools were used. First was Adobe Illustrator, which was used to create and edit some of the vector icons that are used on the website. Illustrator was selected for this task because of the ease with which it allows the user to handle and manipulate vector graphics. This was very useful, since vector images are able to scale without losing any quality, making them perfect for a responsive website such as Pixel Luxury.

The second and probably most important tool utilized was Coda 2. This is a powerful coding application that I was able to purchase online for approximately $75. It is built to handle a number of different coding languages, although in this situation it was only used for coding HTML, CSS, and some JQuery. While there are other types of coding applications available, both free and paid, Coda 2 offered some unique features that were not available in several of the other options. One particularly useful feature of Coda was its ability to show the user all the options they have available to them when typing certain lines of HTML or CSS. For example, if the user types "background" in a CSS document, Coda will automatically show that some of the options for background attribute are, "background-image", "background-align," and "background-repeat." This makes it easy for the user to see all the options they have available at a glance, which is particularly useful for those new to coding.

3.2 Navigational Structure

After the necessary tools had been acquired, a site map was created to show the general navigational structure and flow of the website. This outline was altered numerous times throughout the coding and design process, since some types of structures did not function as well as intended or did not compliment the other aspects of the site.

3.2.1 Site Map

Layout Type: Single Page (broken into sections)

Platforms enabled: Desktop, tablet, and mobile (responsive design)

Section 1: Hero Image and Title

Section 2: Top-Bar Navigation

1. Page Link: "Pixel Luxury" – Returns the user to the top of the website.

2. Page Link: "Home" – Scrolls the user back to the top of the website.

3. Page Link: "Resources" – Scrolls the user to the resources section.

4. Page Link: "About" – Scrolls the user to the about section.

5. Page Link: "Contact" – Scrolls the user to the contact section.

Section 3: Welcome

Section 4: Accordion of Resources

A. Accordion Section: Fonts & Type

    i. Subsection 1: Font Websites

        1. URL Link: Font Fabric

        2. URL Link: Font Squirrel

        3. URL Link: Google Fonts

        4. URL Link: Lost Type

    ii. Subsection 2: Typography

        1. URL Link: Fonts in Use

        2. URL Link: Typekit

   3. URL Link: Web Font Specimen

   4. URL Link: Wordmark.It

  iii. Subsection 3: Articles

   1. URL Link: TBD

B. Accordion Section: Design Tools

  i. Subsection 1: Icons

   1. URL Link: Entypo

  ii. Subsection 2: Textures

   1. URL Link: Lost and Taken

   2. URL Link: Subtle Patterns

  iii. Subsection 3: Vectors

   1. URL Link: Vecteezy

C. Accordion Section: Web Design

  i. Subsection 1: Code Cleaning & Validation

   1. URL Link: JavaScript Beautifier

  ii. Subsection 2: Code Snippets & Tutorials

   1. URL Link: CodePen

   2. URL Link: Codrops

   3. URL Link: CSS Tricks

   4. URL Link: w3 Schools

  iii. Subsection 3: Responsive Design

   1. URL Link: Foundation

D. Accordion Section: Inspiration

  i. Subsection 1: Print

   1. URL Link: Lovely Package

   2. URL Link: Packaging of the World

  ii. Subsection 2: Web

   1. URL Link: Best Web Gallery

2. URL Link: Cool Home Pages

iii. Subsection 3: General

1. URL Link: DesignersMX

2. URL Link: Chic-Type

Section 5: About

Section 6: Contact

URL Link: Personal Portfolio Website

Section 7: Footer

Section 8: Copyright

Chapter 4

Results

4.1 Learn by Doing

The finished Pixel Luxury website is a first class example of Cal Poly's "Learn By

Doing" philosophy. While the research outlined in the literature review helped to create the

outline of the website, a huge portion of the sites creation was experimentation or trial and

error. Thankfully, there is a large amount of free resources that can help new web

developers with their work.

4.1.1 Online Tutorials

A large portion of the website was created by combining bits and pieces of code

from various online tutorials. CSS-Tricks and Codrops, both featured on the website, were

particularly helpful since they contained well-organized guides to achieving many of the

effects present on Pixel Luxury, i.e., smooth-scrolling, accordion sections. The wealth of free

resources and code snippets available online is something that every web developer should

make use of.

4.1.2 Inspecting Elements

Several web browsers offer the ability to examine the code a website uses to

function. The Google Chrome web browser offers a right-click feature called "inspect

element" which was greatly helpful in the creation of Pixel Luxury. By right clicking on an

element in a webpage, Chrome allows the user to examine the files that the website is

comprised off. This is useful for discovering how a particular effect is achieved and coded,

and is often a useful method for "stealing" bits of someone else's code to style various

aspects of your own website. Additionally the inspect element window allows the user to make changes to the websites code that are then rendered live in the browser window. While coding Pixel Luxury, this ability was particularly useful for testing which effect each line of code is creating.

4.2 Challenges and Solutions

4.2.1 Challenge: Responsive Design

Designing a website to be responsive presents a unique set of challenges. Instead of simple creating a static page layout, the designer must consider how the layout can be made "fluid," with elements able to rearrange and scale themselves to fit the various types of viewing devices a user might be on. This also means testing the website on multiple platforms to ensure that elements remain consistent and that the navigation is functioning properly across all devices.

4.2.2 Solution

The challenge of designing a responsive layout was largely overcome using Foundation by Zurb. Foundation is a free-to-download framework that utilizes a column system and percentages in CSS to achieve a responsive design layout. The code to make everything function comes pre-packaged, and ready for download on the website. There are also many options of customization if a user has no need for certain elements. The Foundation website also features a "docs" section which serves as a tutorial for users new to the framework. The doc section contains a large number of easy to follow tutorials that help explain how Foundation operates and the best practices for styling elements using it.

All of this was extremely helpful during the creation of Pixel Luxury, eliminating the need

for hand-coding thousands of lines of code.

4.2.3 Challenge: Navigation

Pixel Luxury aims to present a large amount of information to its users and

therefore needs to be well organized so that they are not overwhelmed. The challenge then

was to create a navigational system throughout the website that allowed the user to

quickly comprehend the information they had available to them in only a few seconds of

scanning the site.

4.2.4 Solution

Some aspects of Pixel Luxury's navigation were defined by code that comes with

Foundation, primarily the top-bar nav. The top-bar navigation allows the user to quickly

jump between the websites larger sections, eliminating the need for them to manually

scroll through the entire page each time they want to see a new area. Using the Foundation

framework, the top-bar navigation, like the rest of the site, is able to scale to fit various

devices while still presenting the same information. By using Foundation's "sticky" class,

the navigation is also able to stick to the top of the browser window as the user scrolls the

page, ensuring that they always have quick access to it.

While Foundation provided the top-bar navigation, there was still the problem of

how to organize the large amount of resources the site offered. Ultimately I settled on an

accordion style navigation to allow the user to quickly narrow down their area of search.

Each accordion is built using HTML, CSS, and a small section of jQuery to animate the

opening and close animations. By putting all of the individual resource items under larger

accordion sections, the user can quickly view all the overarching categories the site offers

without having to scroll or click any buttons. The user can then access an accordion section

to display a manageable, and organized list of resources that pertain to the category of their

choice. Each section can be manually closed or will automatically close if the user decides

to open a different category. A small bit of JavaScript also allows any newly opened

accordion section to animate to the top of the screen, allowing the user to immediately

begin scanning the information without the need to scroll to the top.

4.3 Choosing a Name

One aspect of creating the resource website that I initially overlooked was the name.

While it is only a small portion of the site as a whole, the name of a website can often be an

important factor in driving return views. The name of the website is often one of the first

things that creates an impression for the viewer and as such has an instant impact in their

judgment of the site. While there are many factors that determine what makes a "good"

name for a website, the one that I primarily focused on for Pixel Luxury was implied

meaning.

Initially I had chosen the name "The Vault" for this resources website because I saw

the site as a vault of knowledge. However, I later felt that the word vault would make the

site be associated with something inaccessible, as the term vault is often given to object in

which information or goods are locked instead of freely accessible. This led me to

brainstorm a new direction for the name of the resource site and eventually Pixel Luxury

was chosen. Pixels are an integral part of the design process and so the inclusion of the

word gives Pixel Luxury association with the concept of art and design. The term luxury is often used to describe something that is above-average and high in value, an association that I wanted users to make with the quality of the resources presented on the website. Together, these two words create a name that will hopefully lead users to associate the website with high quality resources that can aid them in their design work.

4.4 Domain Registration and Hosting

One last challenge in creating this website was figuring out how to upload it to the Internet. There are three things necessary for uploading a website: a hosting site, a domain name, and an FTP program.

A hosting site allows you to store your websites files on their servers so that a user's computer can access the information at any time. There are a huge number of web hosting services available for purchase, but for the purposes of this site I decided to use a smaller company called Laughing Squid. Since they are a smaller company, they are designed to cater to users looking to upload smaller websites, versus larger organization like Rackspace that cater to massive corporate businesses. Laughing Squid also had an amazing customer service representative who I was able to talk to and who helped explained some of the best practices for uploading a site. They also recommended their friend Hover as a good place to register a domain name.

A domain name is acquired through a registrar, which most commonly is an online company that lets you view the current available domain names and purchase any that are yet unclaimed. Hover is just one of many domain registering companies, but offers a friendly user interface that makes it stand out from its competitors. Using their website

made it quick and easy to search for my domain name "pixelluxury.com" and register it as

my own for a small annual fee.

      After conducting my business with Laughing Squid and Hover, I uploaded the actual

site through an FTP (file transfer protocol) program called FileZilla. The program is free to

download online and allows the user to transfer files between their local hard drive and

their online server host. In my case this meant uploading some server information to

connect my computer to my server space on Laughing Squid, and from there is a simple

drag and drop process to upload the files online.

Chapter 5

Conclusions

The purpose of this project was ultimately to create a resource website that would be a valuable asset to users studying primarily in the fields of graphic communication and graphic design. Pixel Luxury is able to achieve this goal through it's unique design and UX approach to a resources website. Though it does not yet hold content specifically created for it, Pixel Luxury is able to stand out from its competition through its super clean interface design and easy to use navigation. Additionally Pixel Luxury can be viewed on any type of web enable device thanks to its responsive design layout. This helps to set it apart from other similar websites by focusing on a unique user experience that is carried across all devices.

5.1 Continual Improvement

At the time this paper was written, the contents of Pixel Luxury represented many of the best and most useful resources that were currently available online. Despite this, the list of resources presented on Pixel Luxury is far from exhaustive and there is a nearly endless amount of room for growth. New useful resources are constantly being created and uploaded each and every day and as such, the content of Pixel Luxury should also be continually updated to reflect the best resources the web has to offer. This will require continual research into the latest online resources and possible revisions to Pixel Luxury as new sites are added and old sites become obsolete. This will be the job of the current curator of Pixel Luxury, which for the time being will be myself. For now the website will be

a reflection of the resources and tools that have personally aided me in my design work and will continue to grow as I find new items worth sharing.

5.2 Further Areas of Study

Although Pixel Luxury already offers a large variety of material, there are still a number of areas that could be added or further expanded upon.

5.2.1 Resource Navigation and Sorting

The resources on Pixel Luxury are currently organized by category in the site's various accordion sections. While this serves its purpose at the moment, further growth of the site might cause each of these accordion panels be become too long for comfortable browsing by the user. As the site continues to grow and additional content is added, there is will likely need to be additional filtering systems that help the user find the resources they are looking for.

One option might be to have a sub-navigation system based on a tagging system. Each resource entry could be "tagged" using specific key words that would allow the user to filter the entire catalog and see only resources that fall under certain categories. For example, the user might select to only see items with the tags "fonts" and "commercial-free" if they are looking for fonts they can use for commercial work. This could potentially require a new user interface that better allows for the items on the page to shuffle since the current interface does not account for live changes in display content as the user is browsing.

Another option might be to add a search bar that allows the user to enter their own search terms. This would then query a built in database of information that would return resources and articles that relate to the entered search term. This could potentially create confusion since the user would have to guess which search terms would yield their desired result, instead of having all available terms laid out for them as mentioned in the previous example.

5.2.2 Additional Content Types

Pixel Luxury currently has no original content and is merely a hub that links users to outsides sources of information. A potentially huge area of growth and improvement would be for the curator of the website to create custom resources and articles that would be unique to Pixel Luxury. As mentioned in chapter two of this research paper, it is crucial for a website to be able to generate return views and adding unique content would give users another reason to continually return to Pixel Luxury as new content is released.

5.3 Future Curator

Pixel Luxury could eventually be passed off to a new curator who would add to the body of knowledge. This could be a future students senior project, or the side project of another fellow designer. They would need to have some basic knowledge of how to code with HTML/CSS and be able to understand how the site is designed and structured so that they can properly build upon its framework.

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