

An Analysis of Methodologies and Design Elements in Web Pages

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Abstract

In the course of designing an engaging and user-friendly website, there are several factors which both designers and developers alike must take into consideration. From the design standpoint, font size, colors, contrast, spacing and copy organization, in conjunction with image utilization and placement, can be optimized to provide an aesthetically pleasing and compelling page. The developer, to better facilitate optimal human-computer interaction, must take into account concepts such as button and control placement, the flow of application components, the self-documentation of application features by way of tooltips and the optimization of the code itself in order to provide an experience that is pleasing to the end user.

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An Analysis of Methodologies and Design Elements in Web Pages

The importance of maintaining a web presence on the Internet for a business, regardless of they provide online sales or not, is immeasurable. In this day and age where nearly 75% of the world's population is able to access a cellular telephone (Radio Free Europe/Radio Liberty, 2013) and over 34.3% have access to the Internet (Internet World Stats, 2013) a company would effectively be excluding a wide-reaching demographic by deciding otherwise.

Methodologies and the design elements that comprise an effective webpage, that is, a page that is created to engage users and provide them with some information or form of service, have evolved over the past 20 years. This evolution can be likened to interior design, where tastes in architectural concepts change and grow over time; however, instead of the coordination of colors in drapes and carpets or placement of furniture, the focus is on the color palette of the page and placement and presentation of application controls.

A webpage, as presented to the user, can be broken down into two aspects: the view, or how the information is presented to the user and what they see; and the control, or how the user interacts and navigates through the content.

Methodology Overview

When the World Wide Web was first introduced, the application of developing dynamic content was not yet widely adapted. Pages were primarily self-contained and independent with the imagery, style and visual structure of the website built into each page. From a modification standpoint, if the designer wished to make a change to the overall layout or design of the site, they would be required to edit each and every page.

The common methodology in modern application development is “Model-View-Controller” process where aspects of application development are compartmentalized and

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abstracted for the purpose of task consolidation and organized development. Figure 1 illustrates the Model-View-Controller process.

The Model

The “Model” is the back-end business logic of the application that handles the decision making and information parsing aspects of the program (Leikam, 2013). In the realm of web development, it is generally written using PHP, ASP or Ruby, which is server-parsed code that accepts information from the “Controller.” This will often handle database queries and manipulate the data and information to be fed to the “View” (Stump, 2006a).

The View

In a dynamic web application, the “View” is how the business logic is presented to the user. Based upon criteria such as whether a user is logged in, what type of permissions they have for the application and what page they are trying to view, appropriate, user-specific information is generated and displayed for that person to view (Stump, 2006b). This is often times accomplished through a template system where the information is passed in the form of variables to a skeleton page where the various fields and values are filled in. The design elements of the view is a key contributing factor to the overall success of a site as this is the end-users’ portal and primary method of interaction.

The Controller

The “Controller” in a dynamic web application has a slightly different connotation or, at the very least, a dual meaning. While some controller events can reside within the view, that is, buttons to click and controls to manipulate, it is also a part of back-end logic that is designed to specifically handle requests coming from the client and initiates specific functions of code to

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move the application forward (Stump, 2006c). The client-side components, while contributing to the overall feel of a website is still marginal in relation to the view.

Design Elements

Usability, as it relates to human computer interaction with any application, is a key factor in its success as a marketing tool. The organization and presentation of information and images for a website is even more crucial considering its status as a visually-driven medium.

Several layout and marketing techniques can be employed during the design process to both ensure that a visitor will consume the information you are trying to disseminate and draw them further into the site.

F-Shaped Content

A 2006 study conducted by Jakob Nielsen discovered that the dominant reading pattern for humans reading web pages is in an “F” shape where the first, horizontal movement scans across the upper content – generally the headline or first paragraph of a page, depending on the layout. The second, horizontal movement scans across the next section or paragraph that is shorter in width. The third is a vertical movement which is, “...a fairly slow and systematic scan that appears as a solid stripe on an eyetracking heatmap.”

Based on this study, Nielsen was able to discern three design implications that need to be taken into account when developing and organizing the content of your page:

- Your text will rarely be read exhaustively.
- The most important content must be contained within the first two paragraphs.

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- Begin each section, paragraph or bullet point with “action-carrying” words as a user is more likely to read the first and second words of a paragraph than the following words.

Facial Focusing

When using photography and imagery as design elements in a web page, another useful eye tracking study in 2009 written by James Breeze indicated that “Faces can be used to guides a person’s attention to key content and make sure they actually read it.”

Using eye track software, Breeze showed the same two images to 106 people. One of photographs was of a baby looking at the camera (see Figure 3) while the other image was of the same baby looking at the principle copy (see Figure 4). The heatmap data showed that, while the viewer focused on the baby’s face in both photos, in the image where the baby was looking at the text, more than half of the time was instead spent reading the copy and focused more on the brand.

Usage Pattern Expectations

As people browse from webpage to webpage, there are often times commonalities – or expectations of commonalities -- in design. These are essentially things that that have either always been since the inception of the World Wide Web or design aspects that have evolved over the years.

Since a large portion of Human-Computer Interaction research is focused on how a positive ‘user experience’ (Hassenzahl & Tractinsky, 2006) of interactive systems can be fostered, these methodologies and design elements are seen in a large majority of websites on the Internet.

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Link Colors. Breeze's (2009) research found that blue is the best color for hyperlinks. Whether it be Google, Bing or Yahoo, the standard color of hyperlinks is blue. This goes back more than 20 years ago when NCSA release Mosaic, the Internet's first web browser in which all of the links were blue.

Button Placement. While not used as frequently in the current web design paradigm, there are two functions of a submit button, one that submits or continues form data and another that resets or cancels the form operation. While form design factors into the equation, in 2009, Matthew Cummings of No.Inc.com, a business communications firm, opined that having the submit button on the right and the cancel operation on the left with the button group floating at the bottom left, a method utilized by MacOS is what people have come to expect. This is, in part, because if you were reading a book, you would continue once you reached the bottom right of a page.

However, with the way modern layouts have evolved, we're seeing fewer "Reset" buttons and more terminology such as "Go Back" or "Continue" that, for the world population that reads left to right, are appropriately placed.

Typography and Line Spacing. Font style, size and spacing contribute to how easily copy can be read and the success with which a headline or article can be communicated. A 2009 study conducted by Michael Martin of Smashing Magazine found that 60% of headlines used a sans-serif font in either an 18-20 or 24-26 point font. This included sites such as CNN, ArsTechnica, Slate, BBC and NewScientist. Additionally, he discovered that 66% of surveyed websites also use sans-serif font for the body of the articles at 13 points.

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There have been typographical standards for as long as there have been printed materials. Martin (2009) analyzed the spacing and compared it to typographical standards and found three statistics:

1. The line height in pixels divided by the body copy font size in pixels equaled 1.48. According to Martin (2009), “1.5 is a value that is commonly recommended in classic typographic books.”
2. The line length in pixels divided by the line height in pixels is 27.8, indicating that the average line length is 538.64 pixels, which Martin states “is pretty large, considering that many websites still use 12 to 13 pixels for their body copy font size.”
3. The space between paragraphs in pixels divided by the line height in pixels is .754. Martin was surprised by this result since the spacing is rarely equal to the leading. However, in this case, the 75.4% result coincides with the 75% paragraph spacing convention found in traditional typography.

Conclusion

Methodologies in web development have greatly evolved since the inception of the World Wide Web. When it comes to dynamic web programming, the earlier, self-contained pages have given way to modularized and abstracted architectures. The use of this methodology has allowed for a standardized approach that fosters code reuse and an object oriented design.

When planning the design of a website, developers have moved beyond the common, centered, single columned thematic structure that was prevalent in the early periods of the World Wide Web. Research has shown that, through both the evolution of design and implementing standard marketing strategies, pages can be structured and developed to be both aesthetically

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pleasing while, at the same time, drawing the audience into the content to have them focus on targeted copy within the page.

While the approach of the methodology will always vary based upon the architecture and purpose of the site, the design elements are crucial to implement to produce effective web pages.

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Model-View-Controller Process

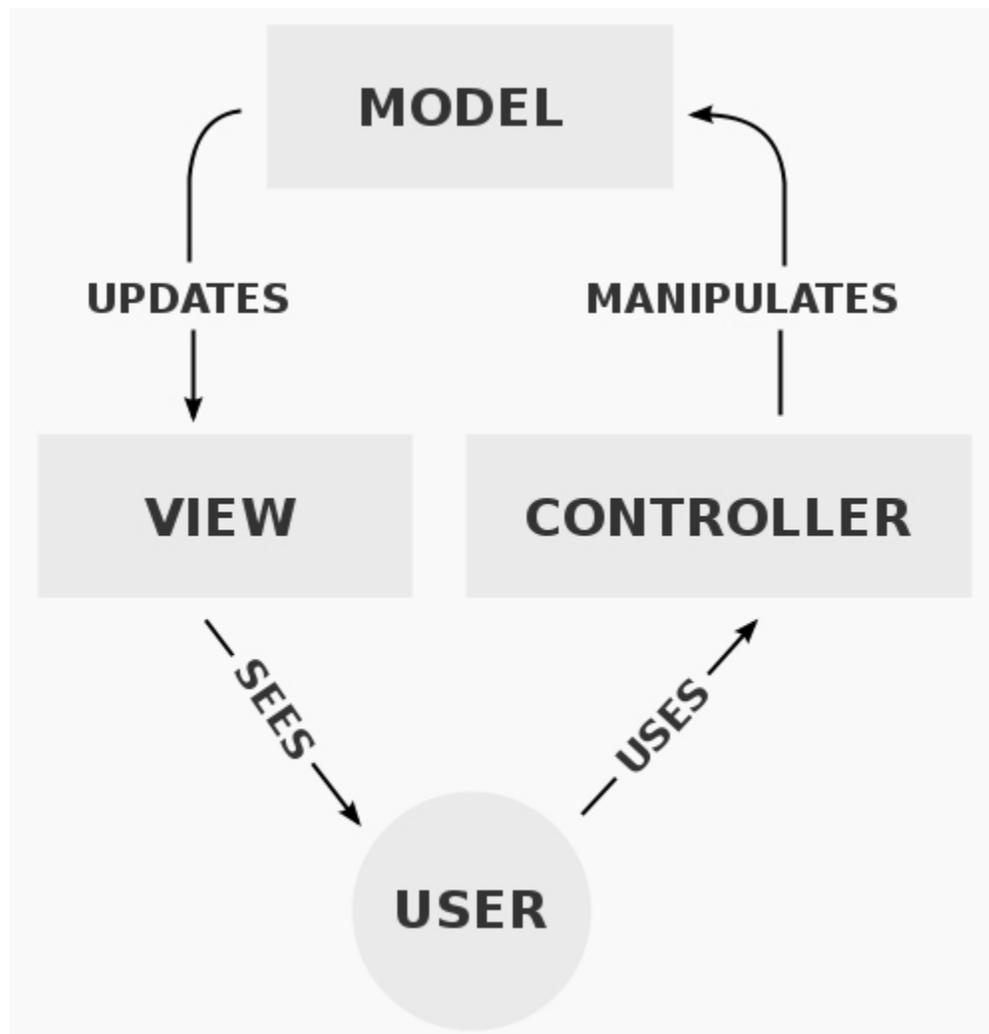


Figure 1. The above is a visual representation of the Model-View-Controller process. Adapted from “Model-View-Controller Process” by R. Frey, 2013. Retrieved April 23, 2013, from <http://en.wikipedia.org/wiki/File:MVC-Process.png>

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F-Shaped Reading Pattern



Figure 2. The F-Shaped reading pattern is how people often scan through the content of a webpage. Adapted from “F-Shaped Pattern for Reading Web Content” by J. Nielsen, 2006. Retrieved April 23, 2013, from http://media.nngroup.com/media/editor/alertbox/f_reading_pattern_eyetracking.jpg

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Facial Focusing

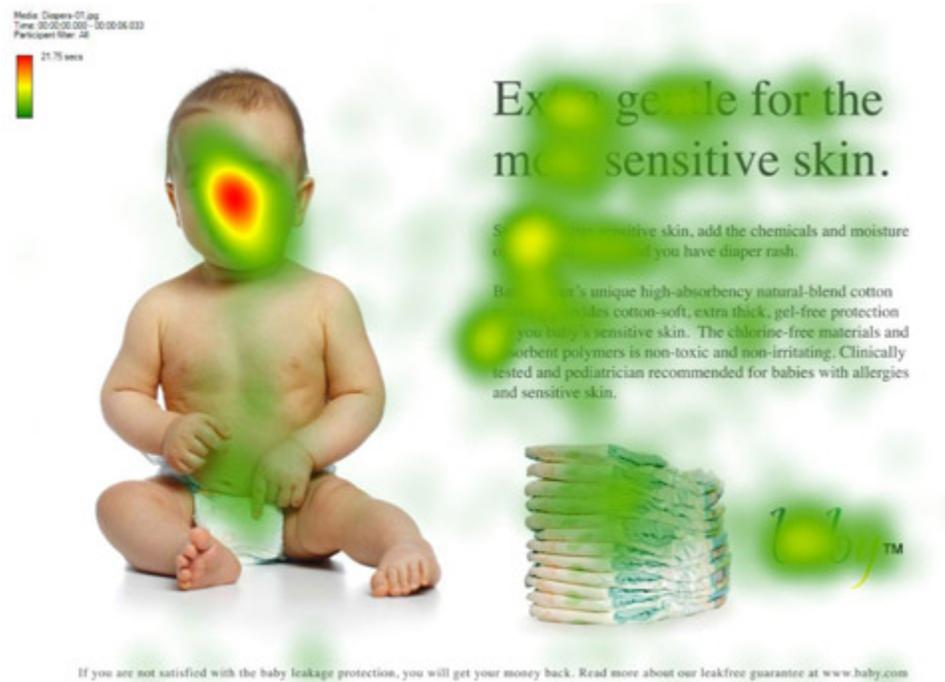


Figure 3. When facial images are used, the eye is drawn to aspects of the image. Adapted from “You Look Where They Look” by J. Breeze. Retrieved April 23, 2013 from <http://web.archive.org/web/20120314083202/http://usableworld.com.au/2009/03/16/you-look-where-they-look/>

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Directional Cues in Imagery

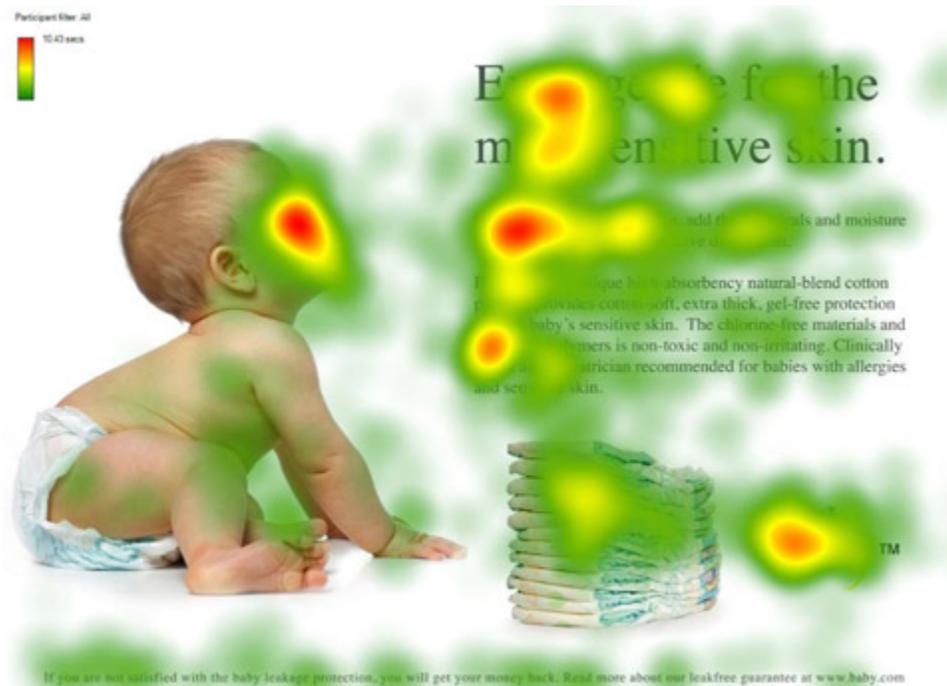


Figure 4. When the subject of an image appears to be looking at something, the eye is drawn to that as well. Adapted from “You Look Where They Look” by J. Breeze. Retrieved April 23, 2013 from <http://web.archive.org/web/20120314083202/http://usableworld.com.au/2009/03/16/you-look-where-they-look/>