

CONCEPTUAL MODEL OF WEBSITE DESIGN ELEMENTS THAT INFLUENCES CREDIBILITY AND TRUSTWORTHINESS

Chris LaValley
University of North Florida
n00166552@ospreys.unf.edu

Karthikeyan Umapathy
University of North Florida
k.umapathy@unf.edu

ABSTRACT

In today's competitive environment, it is important for web designers to understand what design elements are essential for attracting visitors, making the visitor trust the website, and perform intended actions like placing an order and revisiting the site. Trustworthiness of a website heavily relies on a good first impression and visitor's visual perception of the user interface. Therefore, the focus of this research is to investigate the effects of visual design elements on trustworthiness of a site. In this research-in-progress paper, we develop a conceptual model to depict the relationships among website design elements and trustworthiness. This conceptual model aids website designers understand what elements are appealing to the visual senses, and conjures credibility and trust.

Keywords

Conceptual model, website, trustworthiness, credibility, visual design

INTRODUCTION

Websites, particularly those that sell a commodity, abound the Internet. Many of these sites sell the same products but at different prices, and with different descriptions and appearance. However, not all of these websites conjure a feeling of trust or credibility. Nor, do they appear aesthetically appealing or are easy to navigate. Website design elements such as typeface size, typographic layout, element organization, color schemes, pictures, and graphics (images and icons) may promote either a rejection or acceptance, which in turn can be key to attract and retain visitors, and make sales. A disorganized layout with ill-placed elements and a multitude of colored text objects can be unappealing and confusing, leading to a negative response. Conversely, an organized layout with easy to read text and appealing images may elicit a welcoming appeal and positive response. With a multitude of sites vying for a piece of the market share, it is essential for businesses to design a web page that effectively grabs, retains, and sells to a visitor.

Understanding what elements of website design that not only appeal to the visitor but engage and conjure feelings of credibility and trustworthiness is the focus of this study. Based on a comprehensive literature review not only from a trust aspect but also in the area of visual design of web pages, we developed a conceptual model to illustrate the relationships among website design elements, trust, and credibility of a site. The primary goal is to establish what design elements are most effective at instilling trust and credibility while at the same time attaining and retaining the user's attention.

CONCEPTUAL MODEL DEVELOPMENT METHODOLOGY

Conceptual model is a product of systematic qualitative analysis of multidisciplinary knowledge sources performed to gain better understanding of a phenomenon (Jabareen 2009). Conceptual model is interrelated concepts that together provide a comprehensive understanding of a phenomenon. A concept consists of a set of attributes which defines them (Jabareen 2009). Every concept is in relation to the phenomenon under study, to other relevant concepts, and to its own attributes. Concepts and attributes are identified through a systematic synthesis of findings from multiple bodies of knowledge such as peer reviewed research articles. Process followed to generate concepts and attributes are both hermeneutic and comparative in nature as it reflects researchers interpretation of consensus emerged from the knowledge sources (Jabareen 2009). It should be noted that conceptual model is not a theoretical framework or a research model and thus does not provide theoretical explanation of a phenomenon or predict an outcome.

We developed our conceptual model following the conceptual framework analysis procedure described in Jabareen (2009). Conceptual framework analysis procedure describes grounded theory based approach to build conceptual frameworks utilizing comprehensive literature reviews (Jabareen 2009). Conceptual framework analysis procedure consists of following eight steps: (1) conduct extensive literature review on the phenomenon and identify relevant literatures, (2) read comprehensively identified literatures, (3) discover concepts from literatures, (4) deconstruct and categorize the concepts, (5) group similar concepts into same concepts, (6) synthesis and re-synthesis concept groupings to build a framework that helps in making sense of the

phenomenon, (7) validate the conceptual framework by presenting to stakeholders, and (8) rethink the conceptual framework to keep it up to date. In the next section, we present the conceptual model developed following the procedure described above. As a part of this research, we have completed steps 1 to 6.

CONCEPTUAL MODEL OF WEBSITE DESIGN ELEMENTS FOR TRUSTWORTHINESS

Trustworthiness is an important issue in regards to website design, particularly for retail businesses as websites are the core of Internet marketing strategies. Website trustworthiness influences consumer perception of whether the business can deliver the goods and provide stated services, believability of the information provided in the site, and overall confidence of the business capabilities (Urban et al. 2009). Empirical studies have been conducted to demonstrate that website trustworthiness plays influential role in enabling a visitor to engage in actions such as transactions (buying and selling), follow provided advice, and share information (Büttner and Göritz 2008). Research also indicates that usage of appropriate website design elements are key to promote trust and affect visitors’ intended behaviors such as making a purchase (Bart et al. 2005).

Website trustworthiness can be described as willingness of a visitor to take part in a transaction with a business (Ganesan 1994). Trust can include two dimensions: credibility and benevolence (Ganesan 1994). Credibility refers to the degree to which a visitor trusts information provided in the site. Based on the credible information presented in the site, visitor perceives whether the business or service provider has required expertise to perform the job effectively and deliver the promised goods reliably. Visual design elements such as physical appearance, color, layout, and graphics are known to play significant roles in improving credibility and trustworthiness of a website (Chen 2006). Benevolence refers to the degree to which the visitor believes that business is interested in visitors’ welfare and motives to seek mutual gain (Ganesan 1994). Therefore, benevolence dimension associates with business’s ability to protect visitor’s personal and financial information from potential loss to hackers. Thus, benevolence dimensions of trust are consistent with privacy and security concerns of the visitor. In this paper, we focus only on the credibility dimension of the trustworthiness and develop a conceptual model to understand the website design elements that influences credibility and trustworthiness.

We reviewed relevant trustworthiness and visual design literature iteratively and used hermeneutic circle inquiry method to identify concept groupings and relevant design element attributes of the conceptual model. Figure 1 depicts the conceptual model along with details of attributes. It should be noted that this is a preliminary and work-in-progress model, thus, not a complete one. Below, we provide discussions for each concept identified in the conceptual model.

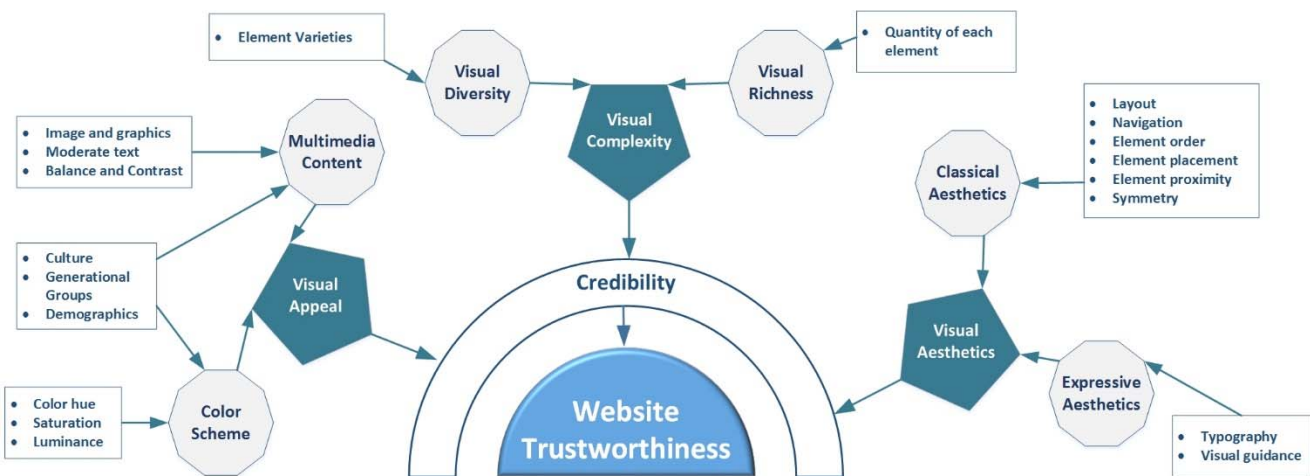


Figure 1. Website Trustworthiness Conceptual Model

Visual Appeal

First impression of a site influences a visitor’s decision to continue exploring the site or leave the site. A good first impression of a site helps to attract visitors, keep them on the site, provide a memorable experience, and improve their return rate to the site. Empirical research findings reveal that visual appeal design elements are the important tools to impress and convert site visitors into a user who is willing to stay, browse, and become a frequent user (Kim and Fesenmaier 2008). The finding of one study showed that visitors can assess visual appeal of a site within 50ms, thus, designers have about 50ms to make a good first impression (Lindgaard et al. 2006). Therefore, it is very crucial that designers understand which design elements can be incorporated to create visually appealing pages for their constituent visitors.

Color Schemes

With all objects we perceive, they are defined by one of many characteristics – color. In the commercial setting, color can influence attitudes and expectations (Cyr et al. 2010). According to research conducted by Cyr, Head and Larios (2010), cultural aspects play a role in which color schemes have an impact on consumer perceptions and different cultural groups have varying preferences and feelings toward the same color schemes. In their study, three color hues were used—blue, grey and yellow for testing. Participants from Germany, Japan and Canada were tested. Their research study findings indicate that blue and grey color schemes were preferred over the yellow color scheme by all groups. However, preference for the grey or blue color scheme was related to the cultural standing of the participants. The Germans preferred blue much more than the other color schemes and more so than any other group. The Canadians, however, preferred grey more than the Germans. The yellow color scheme definitely elicited a negative response from all groups. According to interviews, participants indicated yellow was considered “showy” or “too friendly”. It was also considered a bad color for product presentation. As for trust, the Germans trusted the blue color scheme more than the Japanese. The grey color scheme was more satisfying for the Canadians and the Japanese were less favorable toward the blue color scheme. They concluded that website color appeal was a significant determinant for website trust and satisfaction.

Reinecke and Gajos (2014) presented their findings on users’ visual preference of visual complexity and colorfulness. They gathered data on visual appeal preference from nearly 40,000 participants of diverse demographic backgrounds. Colorfulness refers to a color’s hue (purity of the color regards to primary colors red, blue, and yellow), saturation (intensity of color), and value (luminance or brightness of the color) (Reinecke et al. 2013). Their analysis indicates that preference of visual appeal, in particular the level of colorfulness varies with relation to demographic groups (Reinecke and Gajos 2014). Their findings reveal that females liked colorful websites more than males, neighboring countries have similar preference on colorfulness, and high education level lowers preference for colorfulness.

Multimedia Content

Djamasbi, Siegel, and Tullis (2010) sought to define the web preferences of the Generation Y group (individuals born from 1982 to 2000) by examining the reaction to several factors that may influence their perception of a retail web page in regards to visual appeal. Their findings indicated that Generation Y individuals preferred web pages that included a main large image, minimal text, images of celebrities, and a search feature. Based on eye-tracking, design elements were evaluated in regards to what attracted the attention of the individual while web page browsing. To evaluate appeal, eye-tracking equipment recorded eye movement and fixations within the first five seconds of the viewing (Djamasbi et al. 2010). The fixations determined what object was being viewed. Web pages with a large image were rated as the most appealing while those without a large image were rated as unappealing. Furthermore, those web pages with a large image play an important role in the formation of an impression regarding the page. Their research findings imply that adjusting the size of objects and adding pictures can help cue the viewer into focusing on page elements in a particular order.

Lindgaard et al. (2011) conducted extensive three experiments (each building on previous experiment and findings) to investigate relationships between visual appeal design elements, trustworthiness, and perceived usability. In their study, they investigated role of following design elements: balance (distribution of size, color, and location of visual objects), contrast (degree of difference between elements in size, color, and location), density (ratio between area of the background and the area covered by the element), graphics, symmetry (visual composition across vertical or horizontal axis), and text (Lindgaard et al. 2011). Their findings reveal that pages containing ample graphics, modest amount of text, good balance, and moderate contrast were deemed to be trustworthy. However, density and symmetry elements did not play a role in influencing trustworthiness.

Visual Complexity

Visual complexity refers to the amount of visual variations in the content and organization of content varieties displayed. Visual complexity can also play a decisive role in forming a good first impression of the site (Tuch et al. 2009). Websites with low to moderate visual complexity are known to create favorable attention, attitudes, and intentions from visitors, thereby, influencing their trust (Geissler et al. 2006). Tuch et al. (2009) study shows that website design with low visual complexity, specifically for home pages, helps to improve visitor’s perceived pleasure, remembering the site, and performing tasks like searching.

Visual Diversity

Visual diversity of a website refers to the number of distinguishable elements and dissimilarity between elements (Geissler et al. 2006). Designers should be aware of the level of element diversity used within each page as it influences a visitor’s perception of visual complexity and, in turn, their attention to targeted elements. Geissler et al. (2006) conducted a qualitative empirical study to measure the influence of home page complexity on visitor’s attention, attitudes, and purchase intents. They created three versions of home page – low diversity (one link, one screen page, and one graphic), moderate diversity (five links, two screen pages, and four graphics), and high diversity (thirteen links, three screen pages, and seven graphics). Their findings

reveal that pages with low and moderate element diversifications were effective in influencing visitor attention to targeted elements, their perception of complexity, and their trust. They recommend designers to create pages with moderate element diversity while ensuring visual complexity of the page is not too high which may overwhelm the visitor.

Visual Richness

Visual richness refers to the quantity of each design element displayed in the page, for example, the amount of text, number of graphics, number of hyperlinks, number of multimedia content, page length, and number of columns in layout (Deng and Poole 2010). Deng and Poole (2010) conducted a study to identify the influence of visual richness and web page order on visitor's emotional reaction and ability to facilitate intended behaviors. Their findings show that pages with high complexity (54 links, 14 graphics, and 118 text elements) created unpleasant emotions and failed to lead to intended behaviors like making a purchase. Sites with low complexity (12 links, 2 graphics, and 33 text elements) created pleasant emotions and had carry-over effects on intended behaviors. In the study, they also investigated whether influence on visitor's emotional response and behavior depends upon visitor's metamotivational states such as telic state (goal oriented mindset) or paratelic state (excitement seeking mindset). Experimental finding shows that participants in telic (goal oriented) state felt more pleased and had higher tendency for intended behaviors towards web pages with low visual richness where paratelic (excitement seeking) state participants were more receptive to web pages with high visual richness.

Visual Aesthetics

Website aesthetics plays a crucial role in influencing overall user experience including usability of the site and perceived trust (Tuch et al. 2010). Aesthetics can be categorized into two dimensions: classical aesthetics and expressive aesthetics (Lavie and Tractinsky 2004). Classical aesthetics refers to pleasant, orderly, clear, clean, and symmetrical design of a website. Classical aesthetics provides visual clarity for visitor whereas expressive aesthetics helps visitors perceive the creativity and originality of the site design. Expressive aesthetics refers to designer's creativity such as originality, fascinating design and the use of special effects (Tuch et al. 2010).

Classical Aesthetics

Navigation refers to possible sequence of clicks and paths followed by the visitor to accomplish their goals in the website. Navigation elements have a positive association to trustworthiness particularly for high information content such as retail websites, where taking consumers to their desired product page with a minimum number of clicks is very crucial (Bart et al. 2005). Websites having high content or selling products should be easy to navigate with no or minimal mental effort from visitors. Cyr (2008) study indicates that navigation schemes influence trust and satisfaction, however, this relationship is mediated by culture. Americans and Europeans prefer navigation schemes that enhance their movement within the site while Asians prefer navigation schemes that change appearance of the site (Cyr 2008).

Djamasbi et al. (2010) eye-tracking study on element placement in web pages indicated that certain locations were consistently viewed. The top left corner of the screen received most fixation from study participants. Another location that consistently received fixations was the navigation or internal links area. Based on the number of fixations (average of four), it was suggested that the viewer may look for navigational references for basic orientation when first viewing the page. In contrast to those areas that did receive fixations, there were also areas that did not receive fixations. The fixations were heavily concentrated toward the top of the page and tapered off toward the bottom. Within the first five seconds of the initial view, the bottom portion of the page, that below the fold, received none. Additionally, large text and images consistently had high levels of fixations. When a large image was not present, the first three fixations included navigation links with a large amount of textual information.

Tan and Wei (2006) conducted research on location typicality. Results from their research indicated that ease of site navigation elicited a pleasant response. Furthermore, the establishment of consistent orientation clues, such as header, logo, navigation bars, hyperlinks, sitemaps, etc. and presentational style are important to efficiency and satisfaction (Tan and Wei 2006). The presentation style, as referred by Tan and Wei (2006), is a layout design that should be clear in its purpose, whether it be for commercial, recreation or personal use. By following an established or widely used layout design pattern (company logo placement in upper right corner, help icon and search bar upper left, etc.), users are able to navigate through unfamiliar websites easier since the landscape is familiar. This is particularly true for new users.

Tuch et al. (2010) study examines the effects of web page symmetry on website aesthetics by taking gender differences into account. To aid their research, they selected 20 pages from World Wide Web that had symmetric layout design and another 20 pages that looked asymmetric. A total of 60 people (30 males and 30 females) participated in their experiment. Their experiment findings show that participants considered vertical symmetric pages (i.e., symmetrical along vertical axis) to be aesthetically pleasing and asymmetric pages were considered less pleasing. However, male participants were more unfavorable to asymmetric

pages in comparison to female participants. These findings suggest that designers need to take gender difference into account while creating preferred aesthetics look for target audience.

Element order refers to order and relationship in which different design elements are displayed in a page. Element order also known as web page order is about presenting contents in the page using a logical organization, creating harmony among design element used by grouping similar elements, and creating clarity by contrasting between dissimilar elements (Deng and Poole 2010). Grouping similar elements in a hierarchical arrangement can imply a perception of priority as compared to the other elements. Proximity to one object helps define its relationship with nearby objects. Objects closer to one another tend to be more related than objects further apart (Ellis 1999). Along with visual complexity, Deng and Poole also examined influence of element order on visitor's emotional reaction and ability to facilitate intended behaviors. Their experiment findings show that pages with low ordering (free-form layout of elements without any sense of logical organization) created unpleasant emotions and failed to lead to intended behaviors like making a purchase. Sites with high ordering (layout design pattern along with grouping of similar elements and differentiation of dissimilar elements) created pleasant emotions and had carry over effects on intended behaviors. Experimental findings show that influence of element order on users were also dependent on users' metamotivational states. Participants in the telic state felt more pleased and had higher tendency for intended behaviors towards web pages with high ordering where paratelic state participants were more receptive to web pages with low element ordering.

Expressive Aesthetics

Beyond web page object placement and location typicality, typographic layout of information also influences the first impression (Moys 2014). In Moys (2014), research findings suggest that layout style associated with low, moderate, or high typographic differentiation have an impact on reader judgment. Typographic differentiations can be created by using noticeable variations in typeface, text and graphic sizes, font weight, color, illustrations, and visual effects such as shadows, reflections, and 3D effects. Thus, typographic layout fits with expressive aesthetics concept rather than classical aesthetics, as it requires to bring most of the visual design elements together to create a fascinating design. Moys found that high typographic differentiation was considered to be attention-grabbing, sensationalist, and youthful (appealing to younger readers). Moderate differentiation was considered academic, formal, and serious whereas low differentiation was considered calm. Moys defined high differentiation as documents having tight spacing with no or little prominent white space. Text was placed in multiple columns mixed with images and/or text boxes either placed apart or at angles to introduce compositional movement. Text and graphics overlapped in different places to create a layered effect and there was a high density of color. Moderate differentiation was defined by maintaining an equal use of white space and tight spacing (Moys 2014). A grid system was used setting text in either three columns of equal measure or two equal columns with a proportionate half measure open column. Graphic objects were evenly spaced and aligned to grid system. The main heading was appropriately sized in moderation to create a lead in. Low differentiation documents contained the most salient use of white space and had both characters and lines generously spaced. Composition was either symmetric in nature or asymmetric with the use of white space. The heading, unlike that in moderate differentiation, used moderate to large text with a generous amount of white space to define the lead in. Object frames and rules were used sparingly and were generally light in visual weight. Based on the findings from Moys (2014), it is apparent that the use of typographic layout can be controlled to create a judgment favorable to the material being presented. Understanding the relationships of typographic layout, color and space can lead to the elicitation of preferred impressions.

Branding is crucial for any business yet it is one of the under researched topic in human computer interaction. Bart et al. (2005) found that brand was an important conveyor of trust. Products with strong brand equity enjoy an immediate trust gain in an online environment. Designers need to create brand identity using the site to influence trustworthiness. Brand identity refers to how a brand would be perceived (Yang and Bolchini 2014). Brand identity traits can be embedded into a website using user interface consistency and visual guidance (Yang and Bolchini 2014). User interface consistency can be achieved by using the same navigational and layout design elements for all web pages of the site. Visual guidance can be achieved by grouping, coloring, and positioning text, graphics, and multimedia elements to allow users to easily locate, recognize, and read the content. Yang and Bolchini (2014) studied the role of interface consistency and visual guidance design elements for creating brand identity using websites. They created an anonymized university website to measure influence of consistency and visual design elements on brand identity. Findings of their research reveal that visual guidance influence brand identity, i.e., high visual guidance increase brand identity whereas interface consistency did not play a role. Comparison of participant gender indicated that females are more influenced than males in regards to role of visual guidance for brand identity.

DISCUSSION

The exploration of web page interaction and its design makeup can provide a means to understand the factors that elicit feelings that conjure the perceptions of trustworthiness and credibility. This in turn would provide the basis for effective design to attract and retain visitors. This paper proposes a conceptual framework for understanding which website design elements that promotes trustworthiness and credibility through elicited positive feelings. In this paper, we have presented our preliminary and work-

in-progress conceptual model. It should be noted that several research studies have been conducted on website trustworthiness, however, these studies have been scattered, if not, focused on one or two concepts of trustworthiness. As a part of future work, we intend to expand on design element concepts and develop a holistic model that provides necessary information for web designers to understand which design element affects which aspect of trustworthiness.

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