

Improving Product Display of E-commerce Website through Aesthetics, Attractiveness and Interactivity

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Abstract – *In the development process of online store, the attributes of the product view is very important. The fundamental problem that motivated this study is to find the factors that determine customer acceptance of virtual stores especially related with the product display. Through an experimental study, the features of jcpenny.com, victoriassecret.com and adidas.com have been analyzed with respect to aesthetics, attractiveness and interactivity. We present a theoretical framework that highlights the relative importance of these attributes of display to attract customers. Results of this research are expected to provide a basis for better design and display of product at the online store. The results recommend improved guidelines for product display on e-commerce website. We present, from our experience and conclude with suggestions for design and evaluation of product display at the online store.*

Keywords: E-commerce, Online Catalogue, Aesthetics, Attractiveness, Interactivity.

1 Introduction

Vast advancement of Internet and its mushrooming growth has forced companies to utilize it as a medium to sell their products. Companies are no longer prohibited from doing business for the reason that they are located in different parts of the world. They started having online existence by having online store. A good virtual store should allow customer to see product image, browse the catalogue and select products interactively with ease.

Despite the growing attention given to e-commerce website usability, little is understood as to what are the factors contribute to user decision to buy online product. We need to be aware of the attributes of the product image and the site interface [2] so that user will have better picture of online product.

We argue that well designed e-commerce website interface [2] with aesthetics, attractiveness and interactivity being the main factors in the design can improve user satisfaction thus persuade them to purchase the product. We come up with those three elements as a design rules for evaluating product display usability of the e-commerce site. We intend to identify what are the factors that determine consumer acceptance [4] on

product display and use of virtual stores. We present a theoretical framework that highlights the relative importance of aesthetics, attractiveness and interactivity qualities of online product display that may determine the user decision while shopping online [13].

This paper is motivated by three problems. First, how general e-commerce website usability guidelines can be improved focusing on product display design. Second, how design guidelines can be derived. Third, is it aesthetics, attractiveness and interactivity are the contributing factors towards user decision.

The rest of this paper is structured as follows. In the next section, we present a brief review of the literature. Section 3 discusses the method that we used to gather comments from users. Analysis of the result are addressed in Section 4, including a discussion on three e-commerce website tested. We conclude with a discussion of contributing factors towards user satisfaction on e-commerce website and future work.

2 Background and Hypothesis

Since the nature of web is perceptual, the users intend to see as much details as possible of a particular product [11]. Online shoppers try to make sure that the image of online products such as clothes resembles its concrete appearance. They might try to 'touch' it virtually. However, it is difficult to represent online product so that customer can really feel the product textures [20].

Fang and Salvendy [3] list several design rules focusing on product information of e-commerce website. This include the description of products should be accurate, consistent and comprehensive. Precise and full view of the product should be provided [11]. Another guideline by Van Duyne et al. [19] stated that e-commerce website must allow customers to view details about the products. Website designers should also try to incorporate a clearer product details.

The aforementioned publications regarding e-commerce site usability have the following shortcomings about their guidelines. Fang and Salvendy's [3] work is not focusing on product display. The study by Van Duyne et al. [19] did not discuss about aesthetics, attractiveness and

interactivity of the product display. We improve those guidelines by focusing on the above-mentioned factors.

To the best of our knowledge, no research has been reported focusing on aesthetics, attractiveness and interactivity of e-commerce website in one literature.

Several others (e.g. [2]) have tried to discover the best practice in designing product catalog and image attributes [11]. Spatial arrangement of product image and description may determine accessibility and better recall of product image and description [8]. High quality image display and e-store design has an effect on customer purchasing decision [13]. Kavassalis et al. [12] urged e-marketers to identify the best way to promote and give details about their product, also to engage potential customer [9].

2.1 Aesthetics

Currently there are few specific studies to find how aesthetics can contribute towards improving site appearance [1]. Study by Man et al. [15] found that shopping experience is determined by user-friendly level and aesthetics value of the e-commerce website. Jennings [9] argues that aesthetic experience is relevant to create engaging and immersive e-commerce website environments. Sevenser [17] claims that aesthetic is a major effect on the first impression of certain product.

We argue that user experience can be affected by aesthetics. Other factor that can be included is simplicity of the design [10]. We argue that aesthetic feature is related to the beauty of product appearance.

2.2 Attractiveness

Attractive display may have an effect on website popularity. However, Mahlke [14] found that visual attractiveness does not much contributes towards website usage compared to perceived usefulness and ease of use. Elements of website interface like buttons and pictures have relationship with site credibility. So a highly credible website must concentrate on improving the look of site [4] and this involves attractiveness attributes.

Roberts et al. [16] argue that attractiveness is the strongest factor of an inspiring website. Use of appropriately chosen colors and images or product photo leads to site attractiveness. The consequence has strongest effect among younger population [16]. Product display should focus on the attractiveness of its appearances [7]. Attractiveness results from matching the user's need from the website and the design feature that they expect [20]. We argue that the more attractive the product, the more users will be influenced to buy it.

2.3 Interactivity

Study done by Teo et al. [19] suggests that increased level of interactivity have positive effects on user's satisfaction, effectiveness, and efficiency among all. Better understanding on product interaction and how user

experience the product is significant to increase e-commerce website interactivity.

The user-product interactions should match the user experience [5]. When the user wants to interact with the product display, use of a static image is not sufficient [6]. By clicking and moving the object around, they can interact with it so that they can achieve their intention to play around with the product as if they are in the real store. We argue that interactivity is significantly determining user satisfaction with the product display.

3 Method

To investigate the level of aesthetics, attractiveness and interactivity, this research studied three website that sell item of clothing. These sites are jcpenny.com, victoriassecret.com and adidas.com. These sites have been chosen because all the sites are selling cloth products and are popular sites. We do not want to include any local sites since the international site's brand and identity are established.

We also think that these sites will provide us with sufficient statistical data to compare the level of aesthetic ness, attractiveness and interactivity. We choose three different sites based on three different clothing products (Jcpenny=general apparel, Victoria Secret=intimate apparel, Adidas=sports apparel) to find which of these three factors strongly contribute towards which particular product type.

In this study, we interviewed and asked 28 students and research assistants from a University in Malaysia. Their average age is 24. They spent an average of 17 hours weekly using Internet. Eighteen (64%) of them are male and ten (36%) are female. Only five (18%) of them have at least one experience buying online products or services for instance airline tickets. They are required to complete a buying cloth task from the three sites. Then, they were asked to respond to the set of questions on a 5-point scale (1=not at all; to 5 = strongly agree).

4 Results And Discussions

In analyzing this exploratory study, we compared means (m.) and standard deviation (s.d.) of these three sites based on three factors: aesthetics (AE), attractiveness (AT) and interactivity (IN). It can be clearly seen from table 1 that jcpenny.com scored the lowest rating (3.20) in terms of aesthetics compared to another two sites (victoriassecret.com = 3.89 adidas.com = 4.07). This is also true for the other two factors.

Meanwhile, difference of mean values between victoriassecret.com and adidas.com are about the same throughout the factors investigated. We found that most participants in the survey are satisfied with these two sites.

Adidas.com had the highest level for three features: aesthetics (mean = 4.07), attractiveness (mean = 3.75) and interactivity (mean = 3.68).

Table 1. Means and Standard Deviations

Fac-tors	Jcpenney		Victorias secrets		Adidas	
	m.	s.d.	m.	s.d.	m.	s.d.
AE	3.20	0.52	3.89	0.48	4.07	0.41
AT	3.29	0.48	3.73	0.36	3.75	0.39
IN	2.84	0.57	3.39	0.42	3.68	0.48
Ave.	3.11	-	3.67	-	3.83	-

4.1 Jcpenney.com

Jcpenney.com (average mean=3.11) uses mostly static images as the way to display the product. It offers three ways for the user to interact with the product. The tools (figure 1) are 'see it larger', 'alternate view', and 'pan and zoom'. Even though it has these facilities nevertheless, user cannot completely manipulate the image. Therefore, they cannot experience the real appearance of it. As a result, jcpenney.com scored the lowest interactivity level (mean=2.84).



Figure 1. Jcpenney.com

4.2 Victoriasecret.com

Victoriasecret.com (average mean=3.67) mainly use gorgeous models as the visual imagery. Perhaps user's attraction has turned from looking at the product aesthetics into the model's beauty, not the product attractiveness. Other related websites that related with clothing and apparel may see how victoriasecret.com designed the apparel views and images.

We think that in terms of product attractiveness, the use of an image of people that wear the attire is a good way to sell (mean = 3.73). However, from interactivity aspect,

the conventional clicking and 'mouse over' feature has decreased user interaction, as they cannot fully manipulate the product (figure 2).



Figure 2. Victoriasecrets.com Products Larger View

4.3 Adidas.com

It seems that adidas.com has higher quality e-store designs that affect customer purchase decision (average mean=3.67). Use of Flash (figure 3) is good but the users with slower connection may experience delays. However, the zooming feature has increased user interaction and attracts them to manipulate the products (interactivity, mean = 3.68).

5 Conclusion and Future Work

In order to attract customers to buy online product of e-commerce website, dot-coms are required to improve the product display in terms of aesthetic, attractiveness and interactivity. This study demonstrates that these three factors are vital in the design of e-commerce web sites. It provides an opportunity to maximize customer's satisfaction and may increase customer's retention. Thus, they could potentially generate more revenue in the e-commerce industry.

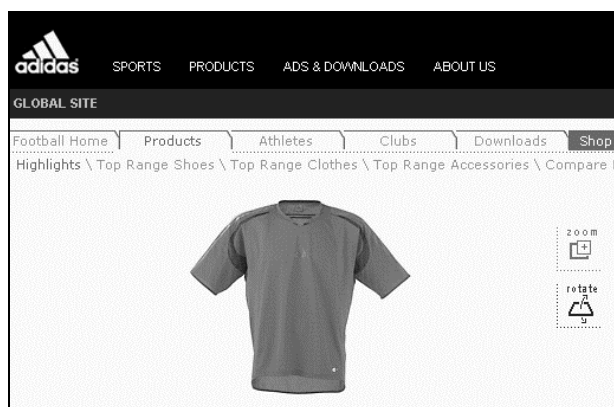


Figure 3. Adidas.com use Flash for Interacting the Product Image

5.1 Suggestions and Implications

The results suggest that e-commerce website can use our findings in the process of designing product display to achieve their goal of persuading the customers. This study also offers contributions to existing research, particularly regarding aesthetics, attractiveness and interactivity, in several ways. First, it offers an empirical assessment on the relationship between aesthetics, attractiveness and interactivity of product display design. Second, this study highlights areas that will improve site quality through these features thus improving the usability of the e-commerce website.

People involved in e-commerce website design are advised to improve the aesthetics and attractiveness appearance of their product as well as the interactivity factor. Real visualization of image can improve product aesthetics. Users are looking forward to see the most real view of the products and to attract users to browse the online catalog. In terms of interactivity, we propose that more 3D-like view being used. For example Flash, VRML and QuickTime 360° view can be used.

5.2 Limitations and Future Works

In our study, we are only focusing on the clothing products. This result may only apply on cloth or fabric product displays. Future study may look into another type of tangible product. Study should involve user satisfaction on the appearance of the product being displayed online compared to real presence. Future study can be done on flash or any 3D tool usability in displaying 3D view of product. Study on user interaction with 3D manipulation of tangible product can also be made. This should not be limited on cloth product but should cover diverse type of products.

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References

- [1] Bertelsen, O. W. and Pols, S., "Criticism as approach to internet aesthetics," Proc. Nordic Computer Human Interface 2004 conference (NordiCHI'04), Tampere, Finland, ACM New York, p.p. 23-32, October 23-27, 2004.
- [2] Callahan, E. and Koenemann, J., "A comparative usability evaluation of user interfaces for online product catalogs", Proc. Electronic Commerce conference 2000 (EC '00), Minneapolis, Minnesota, ACM Press, New York, p.p. 197-206, October 17-20, 2000.
- [3] Fang, X. and Salvendy, G., "Customer-centered rules for design of e-commerce web sites", *Communications of the ACM*, Vol.46, No.12, p.p. 332-336, December 2003.
- [4] Fogg, B.J., Soohoo, C., Danielson, D.R., Marable, L., Stanford, J. and Tauber, E. R., "How do users evaluate the credibility of web sites? A study with over 2,500 participants", Proc. Conference on Designing for user experiences 2003, San Francisco, California, ACM Press New York, p.p. 1-15, 2003.
- [5] Forlizzi, J. and Battarbee, K., "Understanding experience in interactive systems", Proc. Designing Interactive Systems Conference 2004 (DIS'04), Cambridge, Massachusetts, ACM Press, New York, p.p. 261-268, August 1-4, 2004.
- [6] Forlizzi, J., Gemperle, F. and DiSalvo, C., "Perspective sorting: a method for understanding responses to products", Proc. Conference on Designing Pleasurable Products and Interfaces 2003 (DPPI'03), Pittsburgh, Pennsylvania, ACM Press, New York, p.p. 103-108, June 23-26, 2003.
- [7] Hahnä, L. and Redström, J., "From use to presence: on the expressions and aesthetics of everyday computational things", *ACM Transaction of Computer-Human Interaction*, Vol. 9, No.2, p.p. 106-124, June 2002.
- [8] Hong, W., Thong, J.Y.L. and Tam, K.Y., "Designing product listing pages on e-commerce website: an examination of presentation mode and information format", *International Journal of Human-Computer Studies*, Vol.16, No.4, October 2004.
- [9] Jennings, M., "Theory and models for creating engaging and immersive ecommerce websites", Proc. Conference on Computer Personal Research (SIGCPR'00), Evanston, Illinois, ACM Press, New York, 2000, p.p. 77-85, 2000.

JUNAINI, S. N. AND, SIDI, J. (2005), Improving product display of the e-commerce website through aesthetics, attractiveness and interactivity. In Kulathuramaiyer, N., Yeo, A. W., Chai, W.Y. & Eng, T.C. (eds.). Proceedings of the 4th International Conference on Information Technology in Asia 2005 (CITA05), December 2005, Kuching, Malaysia. pp. 23-27.

[10] Karvonen, K., "The beauty of simplicity", Proc. Conference on Universal Usability 2000 (CUU'00), Arlington, VA, ACM Press, New York, p.p. 85-90, 2000.

[11] Katerattanakul, P. and Siaw, K., "Creating a virtual store image", *Communications of the ACM*, Vol.46, No.12, p.p. 226-232, December 2003.

[12] Kavassalis, P., Lelis, S., Rafea, M., and Haridi, S., "What makes a web site popular?", *Communications of the ACM*, Vol.47 (2), p.p. 51-55, February 2004.

[13] Liang, T.-P. and Lai, H.-J., "Effect of store design on consumer purchases: an empirical study of on-line bookstores", *Information and Management*, Vol.39, p.p. 431-444, 2002.

[14] Mahlke, S., "Factors influencing the experience of website usage", In Proceedings of *Computer Human factors in Computing Systems 2002 (CHI 2002)*, 2002, p.p. 846-847.

[15] Man K. C., Waiman C. and Vincent S. L., "Literature derived reference models for the adoption of online shopping," *Information & Management*, Vol. 42 (4), May 2005, p.p. 543-559.

[16] Roberts, L., Rankin, L., Silver, E., Moore, D., Plunkett, S., Washburn, D. and Wilch-Rigen, B., "Looks good to me", *Proc. Human factors in computing systems 2003 (CHI'03)*, Ft. Lauderdale, Florida, ACM Press, New York, p.p.818- 819, April 5-10, 2003.

[17] Sevener, Z., "A semantic differential study of the influence of aesthetics properties on product pleasure." In Proceedings of *Conference on Designing Pleasurable Products and Interfaces 2003 (DPPI'03)*. (Pittsburgh, Pennsylvania 2003). ACM Press, New York, NY, 2003, p.p. 150-151.

[18] Sutcliffe, A., "Assessing the reliability of heuristics evaluation for website attractiveness and usability", Proc. 35th Hawaii International Conference on Systems Sciences 2002 (HICSS'02), Hawaii, IEEE Computer Society, 2002.

[19] Teo, H.-H., Oh, L.-B., Liu, C. and Wei, K.-K., "An empirical study of the effects of interactivity on web user attitude", *International Journal of Human-Computer Studies*, Vol. 58 (3), p.p. 281-305, March 2003.

[20] Van Duyne, D.K., Landay, J. and Hong, J., "The design of sites", *Creative Good*, Addison-Wesley, Boston, 2002.